Infant feeding practices in the context of HIV: A qualitative exploration of the barriers and facilitators to exclusive breastfeeding in one rural and one peri-urban community in South Africa

by

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Thesis presented in fulfilment of the requirements for the degree of

Master of Arts (Psychology) in the Faculty of Arts and Social Sciences at

Stellenbosch University

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December 2017

Declaration

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Abstract

Appropriate early feeding practices are crucial for the survival and health of young children. No breastfeeding or non-exclusive breastfeeding leads to high morbidity and mortality amongst infants. The World Health Organisation recommends that mothers exclusively breastfeed their infants for six months and continue breastfeeding for two years. This includes infants born to HIV-positive mothers, since mixed feeding (combining breast milk substitutes with breastfeeding) significantly increases vertical transmission of HIV. Despite various strategies to improve optimum breastfeeding, most infants receive a combination of breast milk, formula milk and other foods in the first months of life. This is problematic since mixed feeding carries the highest risk of HIV-transmission, diarrhoea and other health problems for infants.

The study used a qualitative design to explore factors that enable or prevent mothers from adhering to exclusive breastfeeding (EBF) in one rural and one peri-urban community in South Africa. Mothers with infants between three and four months of age participated in individual interviews or focus group discussions conducted by trained data collectors in isiXhosa. All interviews were audio-recorded, transcribed and translated into English. Transcripts were coded with ATLAS.ti software and analysed using thematic analysis to identify barriers and facilitators to EBF.

Several barriers were identified that prohibited mothers from practicing EBF. Feeding success, concerns about breast milk sufficiency and infant weight gain played an important role in determining feeding practices. Involvement of other caregivers, time demands of infant care and competing bio-medical and socio-cultural concerns negatively affected EBF adherence. Interventions need to address several enabling factors, including

structural and social support and changing attitudes and subjective norms to provide the conditions conducive to EBF adherence.

Keywords: infant feeding, exclusive breastfeeding, barriers, HIV, South Africa

Opsomming

Toepaslike vroëe voedingspraktyke is noodsaaklik vir jong kinders se oorlewing en gesondheid. Geen borsvoeding of nie-eksklusiewe borsvoeding lei tot hoë sterfte- en siekte-syfers in kinders jonger as ses maande. Die Wêreld Gesondheidsorganisasie beveel aan dat moeders hul babas uitsluitlik vir ses maande moet borsvoed en dat borsvoeding vir twee jaar volgehou moet word. Dit is ook van toepassing op jong kinders van moeders met MIV, omdat gemengde voeding (‘n kombinasie van formulemelk en borsvoeding) die risiko van MIV-infeksie drasties verhoog. Ten spyte van verskeie pogings om optimale borsvoeding te bevorder, word meeste jong kinders in Suid-Afrika ‘n kombinasie van borsmelk, formulemelk en ander kossoorte gevoer tydens die eerste paar maande na geboorte. Dit is kommerwekkend omdat gemengde voeding die voedingspraktyk is wat die hoogste risisko vir MIV-infeksie, gastroenteritis en ander gesondheidskwale vir jong kinders tot gevolg kan hê.

Hierdie studie het ‘n kwalitatiewe navorsingsontwerp gebruik om die faktore wat eksklusiewe borsvoeding (EBV) belemmer of bevorder te ondersoek in een plaaslike en een semi-stedelike gemeenskap in Suid-Afrika. Moeders met babas tussen drie en vier maande oud het aan individuele onderhoude of fokusgroupbesprekings deelgeneem wat deur opgeleide dataversamelaars in isiXhosa uitgevoer is. Alle onderhoude is digitaal opgeneem, getranskribeer en na Engels vertaal. Transkripsies is met ATLAS.ti sagteware gekodeer en geanaliseer deur middel van tematiese analise om die hindernisse en hulpmiddels met betrekking to EBV te identifiseer.

Heelparty hindernisse is geïdentifiseer wat moeders verhoed om EBV te beoefen. Die behoefte om babas suksesvol te voed, bekommernisse oor voldoende borsmelk en gewigstoename het ‘n belangrike rol gespeel in die bepaling van voedingspraktyke. Die

betrokkenheid van ander versorgers, tyd eise ten opsigte van versorging van babas en meedingende bio-mediese en sosio-kulturele oorwegings het die nakoming van EBV negatief beïnvloed. Intervensies moet verskeie magtigingsfaktore soos die beskikbaarheid van strukturele en sosiale ondersteuning, benewens die veranderende gesindhede en subjektiewe norme wat gunstige omstandighede vir eksklusiewe borsvoeding daarstel, aanspreek.

Sleutel woorde: babavoeding, ekslusiewe borsvoeding, hindernisse, MIV, Suid-Afrika

Acknowledgements

With this submission I would like to acknowledge the following people:

Prof Mark Tomlinson, for your continued patience, support and guidance in supervising my thesis. I have gained so much from the knowledge and experience you have shared with me, all of which contributed greatly to my academic and personal growth throughout this process. I am very grateful to have you as my supervisor.

I am deeply grateful to the women who conducted all the interviews and focus groups for this research project. Ncumisa from the Philani team in Zithulele, who took me by taxi and by foot into her community, all the while being eight months pregnant. Vuyo and Nomabhaso in Khayelitsha, for their interest in and commitment to the mothers in this study. Ncumisa, Vuyo and Nomabhaso, thank you for sharing your interviewing experiences with me and providing participants with a comfortable space to share their stories in their first language.

Prof Ashraf Kagee and Dr Bronwyne Coetzee at Stellenbosch University for their expert guidance in conducting and overseeing qualitative interviews.

Dr Karl le Roux at Zithulele Hospital and Linnea Stansert at Philani, for welcoming me to Zithulele and for their input during the data collection process.

Sarah Skeen and Dr Jackie Stewart, initially for logistical and training assistance in Khayelitsha, later for their continued encouragement during the write-up process.

To my mother and sister, for their unfailing support and care throughout.

To my partner Attie, for making me coffee, for making me laugh and for the many kind and uplifting words that helped me finish this thesis

Dedication

I dedicate my thesis to my grandfather, Dave Marlow, who passed away during the write-up process of this thesis. With this dedication, I acknowledge his investment in me, his financial support that afforded me the opportunity to attend university, and for his constant interest in my work. *Oupa* Dave grew up on the same Transkei hills where an important part of the data collection for this study took place. His drive for knowledge and his compassion for people will continue to be an inspiration to me.

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List of Abbreviations

AFASS: Affordable, feasible, accessible, safe and sustainable

ART: Antiretroviral therapy

BFHI: Baby Friendly Hospital Initiative

DHS: Demographic Health Survey

DOH: Department of Health

EBF: Exclusive breastfeeding

FGD: Focus group discussion

GST: General systems theory

HAART: Highly active antiretroviral therapy

HICs: High-income countries

HIV: Human immunodeficiency virus

INFANT: Innate Factors Associated with Nursing Transmission

LMICs: Low- and middle-income countries

MF: Mixed feeding

MTCT: Mother-to-child transmission (of HIV)

PMTCT: Prevention of mother-to-child transmission (of HIV)

RF: Replacement feeding

SDGs: Sustainable Development Goals

UNICEF: United Nations Children's Fund

WHO: World Health Organisation

Chapter 1
Introduction

1.1 Background and Rationale for the Present Study

1.1.1 Infant feeding and child survival. Early feeding practices have a profound impact on the rest of a child's life. Sub-optimal infant feeding and malnutrition increases a child's risk of death and negatively affects health and cognitive development (Black et al., 2013; Olofin et al., 2013; Walker et al., 2011). Families living in circumstances characterised by extreme poverty and high burdens of disease, such as HIV, face a series of barriers to provide their children with safe, nutritious, and age-appropriate foods (UNICEF, 2016), all of which prevent children from achieving their full potential in life (Ferguson, Cassells, MacAllister, & Evans, 2013; Walker et al., 2007). Optimal breastfeeding is a high-impact, cost-effective solution for saving children's lives and for improving a wide range of development outcomes (Rollins et al., 2016).

Optimal breastfeeding has the potential to prevent about 823,000 deaths among children under two years of age each year (Victora et al., 2016), reduces the risk of illnesses such as diarrhoea and pneumonia during infancy (Horta & Victora, 2013b; Lamberti, Fischer Walker, Noiman, Victora, & Black, 2011; Lamberti et al., 2013), and improves cognitive development in childhood (Kramer et al., 2008; Victora, Barros, Horta, & Lima, 2005). In addition to these short-term benefits for child survival and health, breastfeeding can improve intelligence up to adulthood (Horta, de Mola, & Victora, 2015a; Victora et al., 2016).

1.1.2 Exclusive breastfeeding (EBF) recommended for all infants. The benefits and protective effect of breast milk increases with the duration and exclusivity of breastfeeding (Horta & Victora 2013b; Landomenou, Moschandreas, Kaftos, Tselentis, & Galanakis, 2010; Victora et al., 2015). Sub-optimum breastfeeding – no breastfeeding or

non-exclusive breastfeeding for the first six months of life – leads to high morbidity and mortality among infants (Sankar et al., 2015). The United Nations Children's Fund (UNICEF) and the World Health Organisation (WHO)'s Global Strategy for Infant and Young Child Feeding recommends that mothers initiate breastfeeding within the first hour of birth, breastfeed exclusively for the infant's first six months, and continue breastfeeding for up to two years (UNICEF, 2016; WHO, 2016c). Exclusive breastfeeding (EBF) requires that the infant receive only breast milk without any additional food or drink, not even water.

In resource-limited settings, EBF has also been shown to be the safest feeding modality for mothers who are HIV-positive, particularly when EBF is combined with antiretroviral treatment (ART; Rollins et al., 2013). Previously, HIV-infected mothers were advised to avoid breastfeeding and rather replace breast milk with formula milk to prevent any risk of mother to child transmission (MTCT) of HIV (Centers for Disease Control, 1985; WHO, 1998). However, in low and middle-income countries (LMICs), ensuring a consistent supply of formula milk while simultaneously avoiding all breastfeeding is difficult (Bland, Rollins, Coutsoudis, & Coovadia, 2002; Coutsoudis, Coovadia, & Wilfert, 2008). Consequently, infants often receive formula milk in combination with breast milk and other complimentary food, a practice known as mixed feeding.

When formula milk is prepared in unhygienic environments, infants are at risk of receiving over-diluted and contaminated feeds which increases their risk of becoming ill (Andresen, Rollins, Sturm, Conana, & Greinerd, 2007). There is substantial evidence that the benefits of breastfeeding are far greater than the risks of formula feeding for infants born to HIV-infected mothers in LMICs (Coovadia et al., 1999; Creek et al., 2010; Iliff et al., 2005; Kuhn, Reitz, & Abrams, 2009). The WHO regards EBF for six months as the optimal way of feeding infants on a population basis, and this includes infants born to mothers living with HIV (WHO, 2016b). South Africa's most recent Infant and Young Child Feeding

Policy aligns with the WHO's recommendation of EBF for six months for all infants (Department of Health, 2013).

1.1.3 Global and local challenges to improve EBF rates. Despite the nutritional adequacy and benefits of EBF, the majority of mothers do not practice EBF in LMICs (Lauer, Betran, Victora, de Onis, & Barros, 2004; Victora et al., 2016), or worldwide (Cai, Wardlaw, & Brown, 2012; Victora et al., 2016). A wide range of policies and interventions have aimed to increase the rates of EBF in recent years, yet 363 million children (63%) in LMICs are not exclusively breastfed and a further 101 million are not breastfed according to international recommendations (Victora et al., 2016). In South Africa, EBF rates at six months remain amongst the lowest in the world at 8% (WHO & UNICEF, 2012). South Africa has committed to improve breastfeeding through the Tshwane Declaration of Support for Breastfeeding (Department of Health, 2012b) but still has no national data to monitor breastfeeding rates to ensure that policies are being effectively implemented (Richter, 2016).

In South Africa, a combination of breast milk, formula milk, water and complimentary foods such as porridge is the most common feeding practice, even for infants much younger than six months (Bland et al., 2002; Doherty et al., 2012; Kruger & Gericke, 2001; Mamabolo et al., 2004; Mushapi, Mbenyane, Khoza, & Amey, 2008; Sibeko, Dhansay, Charlton, Johns, & Gray-Donald, 2005). Mixed feeding carries the highest risk of HIV-transmission, diarrheal disease and other health problems for infants (Becquet et al., 2008; Fowler, 2008; Sankar et al., 2015). The fact that the feeding practice with the highest risk of HIV-transmission, infant illness and death is also the most commonly practiced amongst South African mothers is a serious public health concern.

Between 1992 and 2009, the WHO developed and/or revised at least 16 different guidelines on HIV and infant feeding (Moland et al., 2010). These changes and revisions

were partly due to the growing evidence base on HIV, and partly due to a growing understanding of the socio-cultural and environmental factors that influence a mother's ability to adhere to safe replacement feeding guidelines (Lazarus, Struthers, & Violari, 2013; Tuthill, McGrath, & Young, 2013). In South Africa, promoting and supporting EBF for all mothers represents a change from previous national policies, in which health facilities distributed free formula milk to HIV-infected mothers who chose not to breastfeed (Coutsoudis, Goga, Rollins, & Coovadia, 2002). Guidelines have been changed in response to research findings, but studies have reported that it has been challenging for healthcare providers and mothers to keep up with the changing recommendations (Chisenga, Siame, Baisley, Kasonka, & Filteau, 2011). The present study seeks to explore the factors that encourage or hinder mothers to practice EBF in light of these changes in policies and feeding norms, and broaden our understanding of how HIV influences the feeding practices of both infected and uninfected mothers in HIV-affected communities.

1.2 Motivation for the Study

Infant feeding practices develop as a result of multiple influences attributable to the mother-infant dyad, the extended family, the broader local culture, as well as from public health, or health care provider, messages (Buskens, Jaffe, & Mkhatshwa, 2007; Rollins et al., 2016). Qualitative research that investigates local knowledge, beliefs and behaviours concerning infant feeding, how they are acquired, and the contextual factors that influence them can contribute to a better understanding of these complex issues (Favin & Baume, 1996). Insight into the actual experiences and challenges of mothers who need to make decisions about infant feeding is essential feedback for creating programmes to encourage the practice of EBF in South Africa. Such findings may help towards bridging the gap between policy and practice in a manner that is accepted by communities (Nor et al., 2012).

The low rate of EBF and the persisting culture of mixed feeding in South Africa highlights the importance of identifying the barriers and facilitators to EBF amongst mothers with young children. In order to improve a practice now deeply rooted in the culture and convention of South African mothers (Doherty et al., 2012), in-depth examination is needed of why certain practices occur, what facilitates EBF and what acts as barriers to safe feeding practices. Previous research has mostly focused on either the HIV-infected or uninfected mother. However, feeding recommendations and counselling directed at HIV-positive mothers and their infants may affect the decisions of HIV-uninfected mothers and vice versa (Bland, Rollins, Coovadia, Coutsoudis, & Newell., 2007). Breastfeeding interventions in countries with high HIV-prevalence rates need to consider all mothers and support safe and appropriate feeding to make EBF a realistic choice for mothers regardless of their HIV status. The present study therefore aims to add to the literature by illustrating how influential factors act to promote or impede the practice of EBF in order to contribute to the future design and implementation of interventions to support optimal infant feeding.

1.3 Aims and Objectives

This qualitative study forms part of the INFANT (Innate Factors Associated with Nursing Transmission) study, a longitudinal cohort study which follows 500 HIV-infected mothers and their uninfected infants from South Africa and Nigeria (Rosenthal et al., 2010). One objective of the larger study is to evaluate the social practices and beliefs regarding breastfeeding mode and the barriers and facilitators of adherence to feeding guidelines amongst HIV-positive women. The research for this thesis was conducted as a subsidiary to the INFANT study. The main aim was to identify barriers and facilitators to EBF in two South African communities with high HIV-prevalence rates. The study set out to achieve this aim through a qualitative research design with the following study objectives:

i) Determine the current normative feeding practices of mothers with infants younger than six months in Zithulele (Eastern Cape) and Khayelitsha (Western Cape).

ii) Identify which factors promote or impede adherence to recommended feeding guidelines. The focus was on EBF, but also explored factors that influence the use of formula milk and complimentary food by this group of mothers.

iii) Explore the impact of HIV on mothers' feeding choice and practice (regardless of their own HIV-status).

iv) Establish whether the above-mentioned factors and practices differ between the rural Eastern Cape and peri-urban Western Cape study communities.

1.4 Overview of Chapters

The following chapter provides an overview of the literature on infant feeding and child survival, while highlighting health benefits and risks associated with different feeding practices in LMICs. The chapter reviews the fluctuations in global and local feeding trends and provides context through a delineation of global and national infant feeding policies and guidelines since 1998. Previously conducted research on factors that influence adherence to safe and appropriate feeding practices globally and locally is set out in this chapter, while emphasising the areas in need of further research. Chapter 3 describes the study methodology, including the research design, the selection of participants, data collection procedure, data analysis and ethical considerations. Chapter 4 describes the results of the study, based on the thematic analysis and organised into six central themes. The central themes are further discussed in Chapter 5 by incorporating theory and highlighting how existing literature supports or contradicts the findings. In conclusion, the findings are used to make recommendations for practice and to discuss the implications for future research.

Chapter 2

Literature Review

2.1 The Role of Nutrition in Child Survival and Health

2.1.1 Child mortality and undernutrition. Early childhood, particularly the first 1000 days of life, is a critical period that determines both resilience and vulnerability to risks for later development (Engle, Dunkelberg, & Issa, 2008). Of the 6.3 million children under five years of age who died globally in 2013, almost half died of infectious causes and just over two-fifths died in the neonatal period (Liu et al., 2015). The various forms of undernutrition (stunting, wasting, micronutrient deficiencies) contribute to 45% of deaths amongst children under five globally (Black et al., 2013). Although under-five mortality rates have decreased globally over the past 30 years, South Africa is one of the 12 countries that reported an increase in under-five mortality rates in 2013 (UNICEF, 2014). The increasing trend in mortality may partly be explained by increasing registrations of death, but a large proportion of newborns and infants in South Africa do not survive early life because of low birth weight, diarrhoeal disease or mother-to-child transmission (MTCT) of HIV (Bradshaw, Laubscher, Nannan, & Nicol, 2011; Velaphi & Rhoda, 2012). In line with global trends, the number of deaths within the post-neonatal period (1-11 months) showed the major increase in numbers between 1997 and 2008 in South Africa (Bradshaw et al., 2011), indicating that infants in this age group are increasingly vulnerable.

2.1.2 Undernutrition and consequences for child development. Despite exceptional gains in child survival over the past 25 years (UNICEF, 2015), the development outcomes of almost 250 million children in LMICs are negatively affected by extreme poverty and the high burden of diseases (Black et al., 2016). Poor living conditions and greater exposure to life-threatening illnesses are compounded by limited access to

resources, all of which prevent children from achieving their full growth and developmental potential (Ferguson et al., 2013; Walker et al., 2007). Nutrition-related factors contribute to increased rates of infectious diseases (Black et al., 2008; Black et al., 2013) and risks for cognitive impairment and poor school performance (Benton, 2010; Victora et al., 2008). Simultaneously, childhood rates of obesity, which is associated with higher risks of adult chronic diseases, have increased dramatically (Black et al., 2013; de Onis, Blössner, & Borghi, 2010), especially in LMICs (Tziourmis & Adiar, 2014). South Africa has undergone a complex health transition (Kahn, 2011) with non-communicable diseases contributing substantially to the disease burden (Kimani-Murage et al., 2010). Undernutrition is a persisting issue due to continued food insecurity (Health Sciences Research Council, 2004), while a marked shift towards energy dense diets occurring alongside urbanisation increases rates of overweight and obesity in communities (Vorster, Venter, Wissing, & Margetts, 2005). Therefore, both undernutrition and obesity-related diseases contribute substantially to the burden of disease in these societies (UNICEF/WHO/World Bank, 2016), especially when they co-occur, a phenomenon known as the "dual burden" (Tziourmis & Adiar, 2014).

2.1.3 Appropriate infant and young child feeding. Every mother must make a decision as to what and how she will feed her infant during the first months of life and as the child grows older. A mother may choose to breastfeed her infant, make use of a breast milk substitute like infant formula milk, or decide to supplement breastfeeding with other liquids and foods (mixed feeding). Each of these feeding options can be executed, or combined, in a variety of ways throughout infancy and early childhood. Table 1 indicates the feeding options for infants and young children, according to the WHO's infant feeding definitions (WHO, 2008).

Table 1

World Health Organisation infant feeding definitions

Feeding Practice	**Definition**
Breastfeeding:	
Exclusive breastfeeding (EBF)	Infant receives only breast milk and no other type of milk or solids, but can include vitamins, drops of medicines and oral rehydration therapy (ORT)
Predominant breastfeeding*	Infant receives breast milk as the predominant source of nourishment; the infant may also receive liquids (water and water-based drinks, fruit juice), ritual fluids and ORT, drops or syrups (vitamins, minerals and medicines)
Partial breastfeeding*	Infant receives some breast milk, and some artificial feeds, either milk or cereal, or other food; the infant may also receive liquids (water and water-based drinks, fruit juice), ritual fluids and ORT, drops or syrups (vitamins, minerals and medicines)
No Breastfeeding:	
Replacement feeding	Infant receives no breast milk, rather breast milk is replaced with artificial feeds, either milk or cereal, or other food

*Predominant and partial breastfeeding is classified as 'mixed feeding', whereby the infant receives breast milk (any amount) in combination with other liquids (e.g. formula milk) and/or complimentary foods (cereal or other soft and semi-solid foods)

During the first six months of life, the key factors affecting the infant's nutritional status include what type of milk or liquids the infant receives, and at what age solid foods are introduced (WHO, 2009). Given the persisting challenge to improve child mortality, morbidity and malnutrition globally, a substantial body of research has been conducted to investigate solutions and strategies to address these issues more effectively (Bahl et al., 2005; Bhutta et al., 2008; Bhutta et al., 2013; Black et al., 2013; WHO Collaborative Study Team, 2000) and to inform policy on infant feeding (WHO, 2003a; UNICEF, 2016). The literature strongly supports breastfeeding as the most effective strategy to improve child survival and development (Victora et al., 2016). Given these findings, the WHO and

UNICEF recommend that mothers initiate breastfeeding within the first hour of birth, breastfeed exclusively for the infant's first six months, and continue breastfeeding for up to two years (UNICEF, 2016; WHO, 2016c). EBF for the first six months of life is recommended, since the benefits of exclusive breast milk increases with early initiation (Khan, Vesel, Bahl, & Martines, 2015) and the duration of breastfeeding (Sankar et al., 2015).

2.2 The Benefits of Breastfeeding

2.2.1 Breastfeeding for child survival. Breastfeeding is a key survival strategy, one of the few where survival benefits span the entire continuum of childhood (Sankar et al., 2015). A number of reviews have used pooled analyses to evaluate the impact of breastfeeding on child mortality. The 2003 Lancet Series on Child Survival identified breastfeeding as a key intervention that could prevent up to 13% of under-five deaths annually (Jones et al., 2003). The 2008 Lancet Series on Maternal and Child Undernutrition reported that sub-optimum breastfeeding has large mortality consequences worldwide (1.3 million deaths), with non-exclusive breastfeeding in the first six months of life responsible for three-quarters of the burden (Black et al., 2008). Although the 2013 Lancet Series on Maternal and Child Nutrition reported a substantial reduction to the 2008 figure, sub-optimum breastfeeding was still estimated to cause 804,000 of deaths (11.6%) annually (Black et al., 2013).

A meta-analysis by Sankar et al. (2015) reviewed the effects of optimal breastfeeding on mortality in infants and children ages 0-23 months and found that infants who received mixed feeding were 2.8 times more likely to die than those who were exclusively breastfed, while no breastfeeding resulted in a 14-fold higher risk of mortality. The most recent Lancet Series on Breastfeeding reported that the scaling up of breastfeeding would save an estimated 823,000 annual deaths – 13.8% of deaths of children under two

years of age (Victora et al., 2016). These estimates strongly support breastfeeding, particularly EBF for six months, as one of the most powerful interventions to save child lives.

2.2.2 Breastfeeding for lifelong health. Beyond child survival, there is an exceedingly large number of short- and long-term benefits of breastfeeding, which have been well-reviewed in the literature. Breast milk is regarded as a 'gold standard' for protective nutrients (Walker, 2010), and its immunological components support the development of the newborn's own immune system (M'Rabet, Vos, Boehm, & Garrsen, 2008). EBF during the first six months of life protects against diarrhoea (Lamberti et al., 2011), respiratory infections such as pneumonia (Lamberti et al., 2013) and reduces the number of hospital admissions due to these illnesses by 72% and 57% respectively (Horta & Victora, 2013b). Exclusively breastfed infants, compared with non-breastfed infants, have fewer infections and less severe episodes of disease, resulting in fewer clinic visits and hospitalisations (Bahl et al., 2005; Ladomenou et al., 2010).

Breastfeeding also facilitates interaction and bonding between a mother and her infant at a critical moment in early development when the right nourishment and care can influence the formation of neural pathways in the brain (Liu, Leung, & Yang, 2014). Studies have reported that breastfeeding promotes cognitive development (Kramer et al., 2008) and intelligence (Belfort et al., 2013), improving performance in intelligence tests in childhood and adolescence (Horta et al., 2015a; Horta & Victora, 2013a). A long-term follow-up of a birth cohort in Brazil showed a dose-response association between breastfeeding duration and increased child intelligence, educational attainment, and income at the age of 30 years (Victora et al., 2015).

Breast milk fulfils all of infants' nutritional requirements for the first six months of life (Kramer & Kakuma, 2012; Naylor & Morrow, 2001). Even in affluent conditions, the

early introduction of food add no growth advantage over EBF (Dewey, 2001). Rather, a growing evidence base suggests that breastfeeding may help to reduce overweight and obesity (Horta, de Mola, & Victora, 2015b; Victora et al., 2016), which lowers the risk of adult diabetes and cardiovascular disease.

The literature has also reported that breastfeeding is beneficial to mothers, as it helps with birth spacing (Becker, Rutstein, & Labbok, 2003), protects women against breast and ovarian cancer (Chowdhudry et al., 2015; Collaborative Group on Hormonal Factors in Breast Cancer, 2002), cardiovascular disease (Schwarz et al., 2009) and type two Diabetes Mellitus (Aune, Norat, Romundstad, & Vattern, 2014; Stuebe, Rich-Edwards, Willett, Manson, & Mitchels, 2005). The evidence for the long-term benefits of longer duration of breastfeeding for both maternal and child health outcomes highlights the relevance of supporting breastfeeding in high- and low-income settings alike (WHO, 2016c).

2.2.3 Breastfeeding for economic growth. In light of the costs associated with child morbidity and loss of developmental potential (Rollins et al., 2016), promoting EBF is one of the most effective child health interventions feasible for implementation at population level in LMICs (Bhutta et al., 2008). Breast milk substitutes require materials for packaging, fuel to transport and distribute these products, while cleaning agents for daily preparation need to be purchased by the families who use them (Coutsoudis et al., 2008). Breast milk does not have to be heated or cooled before use, requires no utensils, and is readily available in environments with poor sanitation and unsafe drinking water (Linnecar, Gupta, Dadhich, & Bidla, 2014). In light of high HIV-prevalence rates, breastfeeding is an especially important strategy for low-resource communities where the risks of replacement feeding cannot be as successfully managed as in well-resourced communities (Coutsoudis, 2005). If scaled up to nearly universal levels, breastfeeding could add more than $300 billion to the global economy each year (Holla-Bhar, Iellamo, Gupta, & Smith, 2015; Rollins et al.,

2016). From reduced disease incidence to increased economic growth, breastfeeding will be a key driver in achieving the Sustainable Development Goals (SDGs; UNICEF, 2016).

2.3 Barriers to Improving Exclusive Breastfeeding Rates

Although progress has been made since the 1990s, reviews of global trends report modest improvements in EBF amongst children younger than six months (Victora et al., 2016). Globally, just over 40% – or two out of five – of the world's infants under six months of age are exclusively breastfed (UNICEF, 2016). While breastfeeding is common in most parts of the world, EBF is not the norm and most infants receive other foods or liquids throughout the first six months (Cai et al., 2012). The Global Strategy of Infant and Young Child Feeding sets a target for at least 50% of infants under six months to be exclusively breastfed by 2025 (WHO, 2012). While 26 countries have successfully reached this target, many countries are struggling to increase national EBF rates (Victora et al., 2016), including South Africa.

In South Africa, EBF is rare. The frequency of EBF to six months remains one of the lowest in the world (WHO & UNICEF, 2012), although surveys report some improvements since the introduction of new policies on infant feeding (Goga, Dinh, & Jackson, 2012). The respective 1998 and 2003 South African Demographic Health Survey (DHS) reported that 6.8% and 8.3% of infants younger than six months were breastfed exclusively (Department of Health, Medical Research Council, & Measure DHS, 2002; Department of Health, Medical Research Council, & OrcMacro, 2007). The more recent South African National HIV Prevalence, Incidence, Behaviour and Communication Survey conducted in 2008 indicated that 25% of infants were exclusively breastfed during the first six months, while 51% of infants received mixed feeding (Shishana et al., 2010). The EBF rate reported by the survey is significantly higher than previous national reports and should be interpreted with caution since the sample included only 506 children.

Two specific issues have undermined global and local efforts to promote breastfeeding and successfully increase adherence to EBF. While the first issue has had global implications, the second has been challenging for LMICs in particular. First, breastfeeding behaviours have been influenced by the increased marketing and availability of breast milk substitutes (Brady, 2012; Piwoz & Huffman, 2015). These products are readily available in LMICs as manufacturing companies widened their markets to include distribution to low-income sectors (Jelliffe & Jelliffe, 1978). Second, mothers who are HIV-positive risk transmitting HIV to their infants through breast milk (Thiry et al., 1985). This risk has changed the landscape of infant feeding in LMICs, especially the practice of breastfeeding, in HIV-affected populations (Coutsoudis, Kwaan, & Thomson, 2010).

2.3.1 Increased use of breast milk substitutes. During the 20th century, breastfeeding became less common in high-income countries (HICs) as women were increasingly employed away from home and began to make use of breast milk substitutes (Brady, 2012). Breast milk substitutes became a symbol of prestige and affluence, while breastfeeding was considered an old-fashioned practice for those unable to afford infant formula (Meldrum, 1982). Over the years, infant formula milk has been promoted by producers and distributers as a substitute suitable for all infants, instead of a specialised food for mothers unable to breastfeed (McFadden et al., 2016). Media campaigns have consistently portrayed infant formula to be as good as breast milk, while presenting it as a favourable lifestyle choice for mothers (Piwoz & Huffman, 2015). These products were also promoted in LMICs where the high rates of birth ensured a larger potential market (Willumsen, 2013), which drastically affected breastfeeding rates (Jelliffe & Jelliffe, 1978). Manufacturers used national healthcare systems to promote their products or distribute free samples to mothers (Aguayo, Ross, Kanon, & Ouedraogo, 2003; Feldman-Winter et al., 2012), increasing the rates of bottle-feeding in these countries (Rollins et al., 2016).

2.3.1.1 Adverse effects of formula feeding in LMICs. Since infant formula is not a sterile product and provides a favourable medium for bacterial growth, appropriate handling, safe preparation and uncontaminated water and bottles for formula milk is essential (Agostoni et al., 2004). Several earlier studies reported high bacterial contamination of breast milk substitutes prepared for infants, especially in feeding bottles (Black, Brown, Becker, Alim, & Merson, 1982; Imong et al., 1995; Morais, Morais, & Sigulem, 1998; Morais, Sigulem, de Sousa Maranhão, & de Morais, 2005; Suthienkul et al., 1999). Contamination is often associated with poor hygiene, unclean feeding utensils, low socio-economic status and prolonged periods of storage (Black et al., 1982; Henry, Patwary, Huttly, & Aziz, 1990; Imong et al., 1995). Consequently, infants in LMICs often received over-diluted and contaminated formula milk, increasing the occurrence of gastro-intestinal disease, hospital admissions and malnutrition (Brady, 2012; Faber, Oelofse, Kriek, & Benade, 1997; Hengstermann et al., 2009; Jelliffe, 1972; McNiel, Labbok, & Abrahams, 2010). The increased use of formula milk in countries with low household incomes and limited access to resources resulted in outbreaks of diarrhoea and increased risk of mortality, as was the case in Botswana following wide-spread contamination of water supplies in 2006 (Arvelo et al., 2010; Creek et al., 2010).

2.3.1.2 The Code for Marketing of Breast Milk Substitutes. The high number of global retail sales indicate that formula milk marketing strategies are effective, emphasising the importance of laws and regulations to curb inappropriate market practices to protect breastfeeding (Rollins et al., 2016). Calls for an international code for marketing of breast milk substitutes were raised by representatives from governments, health organisations and campaign groups at a WHO/UNICEF meeting held in Geneva, Switzerland in 1980. The following year, a draft was formulated and in 1981 the International Code for Marketing of Breast Milk Substitutes was adopted by the WHO (WHO, 1981). The Code aims to

contribute to the provision of safe and adequate nutrition for infants by protecting and promoting breastfeeding and by ensuring the proper use of breast milk substitutes (WHO, 1981). The Code framed breastfeeding as a good way of feeding infants, as it prevents infectious diseases and provides "ideal food" for infants. However, the legitimacy of a market for formula was also acknowledged.

The Code regarded mothers as the main actors in deciding the method of infant feeding, and that mothers were therefore the primary target group to reach with information and to protect from misinformation. South Africa adopted the Code as policy but initially did not pass any legislation, which led to numerous violations of the Code (Taylor, 1998; Richter, 2016). The 1998 DHS showed that 48% of infants aged 0-3 months were formula fed, and the 2003 DHS showed little improvement, with 40% of infants less than four months of age being formula fed (Department of Health, Medical Research Council, & Measure DHS, 2002; Department of Health, Medical Research Council, & OrcMacro, 2007). In December 2012, South Africa adopted the International Code of Marketing of Breast Milk Substitutes into legislation to prohibit uncontrolled marketing of formula milk (National Department of Health South Africa, 2012a).

2.3.2 Prevention of vertical transmission of HIV and formula feeding. In HICs with lower risks of infectious disease, better access to health care and favourable conditions for preparing infant formula, HIV-infected mothers can formula feed their infants to avoid any risk of HIV-transmission through breast milk (American Academy of Paediatrics, 2012). With increased awareness in LMICs of the risk of postnatal MTCT of HIV through breastfeeding, infected mothers initially chose to avoid breastfeeding and opt for formula feeding (Coutsoudis et al., 2002), as in HICs. Feeding policies directed at HIV-positive mothers in LMICs attempted to support the avoidance of breastfeeding by recommending

the use of formula only when it was safe to do so (WHO, 2001). In South Africa, health facilities attempted to encourage replacement feeding for infants of HIV-positive mothers through the provision of free formula milk at hospitals and clinics (Doherty et al., 2011; Ijumba et al., 2013). As a result, the use of formula feeding increased and became a more common practice, especially in HIV-affected communities. However, the feeding practices of HIV-infected and HIV-uninfected mothers (or women of unknown status) are not mutually exclusive (Bland et al., 2007). With more HIV-positive women choosing formula feeding, there occurred a spill-over effect of formula feeding in the general population of mothers (Bland et al., 2002; Coutsoudis et al., 2002). This was problematic, since formula feeding involves risks for both infected and uninfected mothers in low-income settings (Coutsoudis et al., 2008; Humphrey, 2010; Lamberti et al., 2011).

Although avoidance of any breastfeeding eliminates the risk of postnatal MTCT of HIV, complete avoidance of breastfeeding is either not possible or it is not the most favourable option for many women in LMICs (Doherty, Chopra, Nkonki, Jackson, & Greiner, 2006a). Data from earlier studies conducted in sub-Saharan Africa reported that the reductions in HIV-transmission achieved with formula feeding were replaced by significant increases in HIV-unrelated mortality (Becquet et al., 2007; Thior et al., 2006). Deciding between breastfeeding and formula feeding for infants born to HIV-infected mothers is complicated, since the options available – breastfeeding or no breastfeeding – both involve risks to child health and child survival (Moland et al., 2010). Simply advising against breastfeeding has not been successful, given the strong culture of breastfeeding and the particular epidemiologic and political realities in many LMICs (Kuhn et al., 2009). As a result, the topic has been widely debated amongst researchers and policy makers. The following section reviews global and local efforts taken to support breastfeeding, while simultaneously trying to minimise the risk of MTCT of HIV and maximise child survival.

It provides a review of global policies and recommendations on infant feeding from the WHO, with a specific focus on the evidence on HIV-transmission risk associated with infant feeding that have informed changes in policies on infant feeding in the HIV era.

2.4 Evidence, Policies and Guidelines on Infant Feeding

2.4.1 Long-standing support for breastfeeding. The WHO has long emphasised the importance of breastfeeding and supported its practice through a variety of initiatives. The Code for Marketing of Breast Milk Substitutes (WHO, 1981) framed breastfeeding as an ideal way to feed infants and aimed to promote breastfeeding through protecting mothers from misinformation about breast milk substitutes on the market. Additional resolutions have since been added to strengthen the Code, such as the Innocenti Declaration on The Protection, Promotion and Support of Breastfeeding (UNICEF, 1991) and the Baby Friendly Hospital Initiative (BFHI), launched in 1991 (WHO & UNICEF, 2009). The Innocenti Declaration called for governments to take concrete action to protect, promote and support breastfeeding. It was reaffirmed and broadened in 2005 to include targets that would ensure that other sectors, not only the health sector, provide women with the support they require for breastfeeding from the family, community and workplace (UNICEF, 2005). The BFHI is a global programme launched by the WHO and UNICEF in recognition of the important role of maternity services in early support and protection of breastfeeding (WHO & UNICEF, 2009). The initiative includes ten steps for maternity wards and their staff to support mothers to initiate breastfeeding immediately after birth, showing them how to breastfeed and maintain the practice. Since its launch, more than 152 countries have signed up to the initiative (WHO, 2016a), and by 2012, close to 31% of facilities in LMICs were designated baby friendly (Richter, 2016).

2.4.2 HIV and breastfeeding. Since HIV was first detected in breast milk in the 1980's (Thiry, 1985), the WHO has struggled to establish guidelines and implement policies on infant feeding for the HIV-infected mother, particularly in LMICs (Young et al., 2011). When PMTCT programmes were initially implemented there was very little evidence regarding the risk of HIV-transmission and any type of breastfeeding (exclusive or mixed) was thought to carry a risk of HIV transmission (Doherty et al., 2012). As the evidence base on breastfeeding and HIV evolved, so did the feeding policies that guided global and local recommendations for infants born to HIV-positive mothers. Figure 1 provides a timeline of the recommendations on infant feeding and HIV as stipulated in the guidelines provided by the WHO and national policies from South Africa's Department of Health (DOH).

2.4.2.1 Breast milk substitutes to avoid MTCT. Given that absolute avoidance of breastfeeding would eliminate any risk of postnatal MTCT of HIV, breast milk substitutes were initially recommended by the WHO in 1998 (WHO, 1998). The guidelines stated that infants who received replacement feeding would avoid all risk, provided they had an uninterrupted supply of nutritionally adequate and safely prepared breast milk substitutes (WHO, 1998). Although breastfeeding was still an option in the absence of satisfactory substitutes to breast milk, these guidelines indicated a shift in WHO policy from recommending breastfeeding for all mothers (Latham & Greiner, 1998). The WHO incorporated guidelines on HIV and infant feeding into a publication in 2001 following a technical consultation by an inter-agency task team on MTCT of HIV (WHO, 2001). The guidelines acknowledged that replacement feeding is the only way to completely avoid post-natal HIV transmission, but also recognised that this may not be possible in many circumstances.

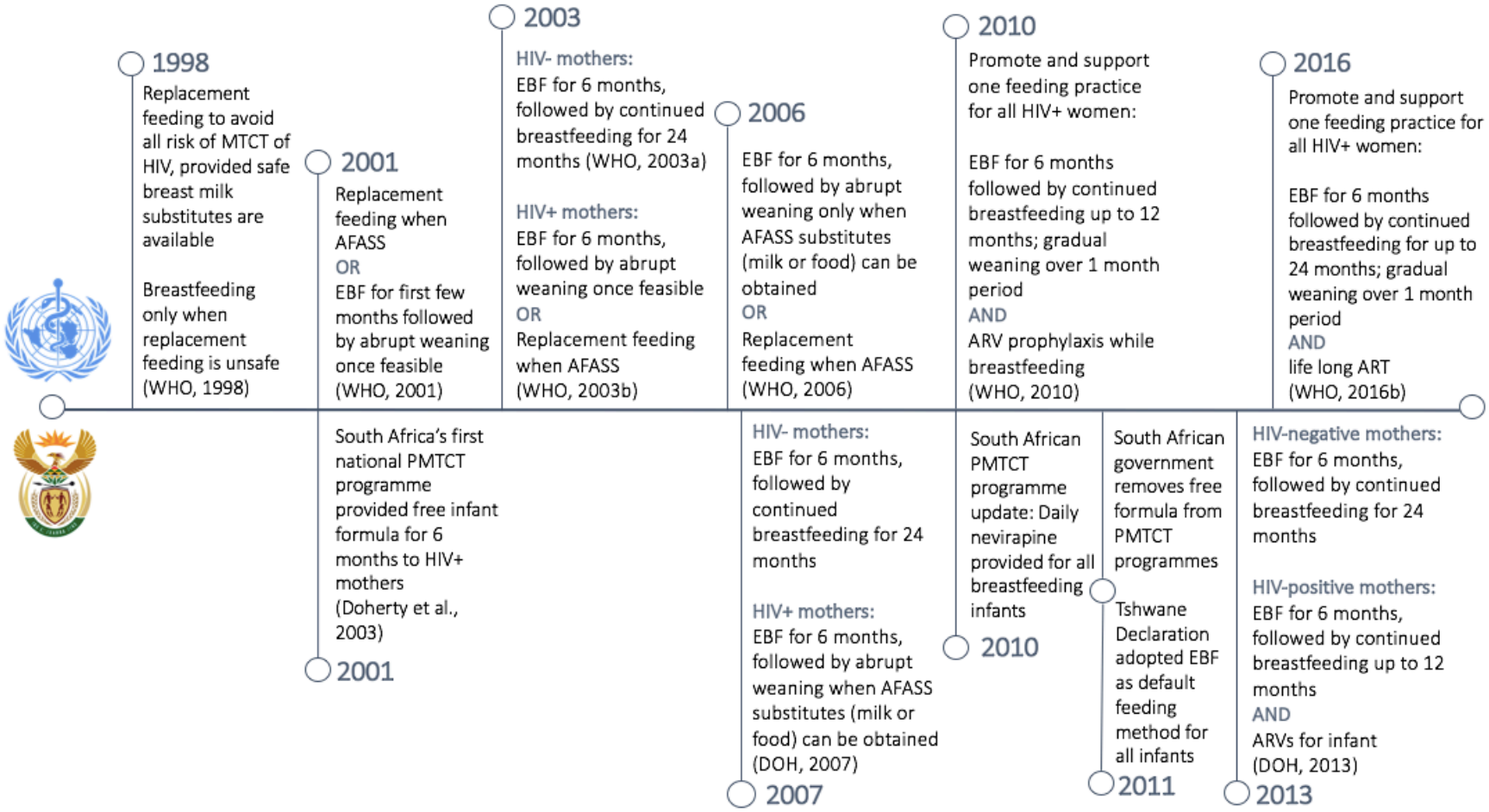

Figure 1. Global and national policies on infant feeding and HIV: 1998 - 2016

2.4.2.2 Breast milk substitutes and the AFASS criteria. As a result, the WHO introduced a set of criteria to guide the use of replacement feeding which specified that mothers who choose replacement feeding should only do so if it is acceptable, feasible, affordable, sustainable and safe – known as the AFASS criteria (WHO, 2001; WHO 2003b). In the absence of AFASS criteria, EBF was recommended during the first months of life, followed by abrupt weaning to minimise the risk of HIV transmission. However, the time at which breastfeeding should be discontinued was not specified. In order to support mothers to make use of replacement feeding that adhered to the AFASS criteria, government PMTCT strategies in countries like South Africa provided free infant formula to HIV-positive mothers (Doherty et al., 2003). Infant formula was also provided to HIV-positive mothers through non-governmental organisations (de Waght & Clark, 2004) and as part of research studies in sub-Saharan Africa (Becquet et al., 2007; Thior et al., 2006).

2.4.2.3 Research on breastfeeding and HIV transmission. An early study conducted in Kenya reported that, compared to the standard practice of breastfeeding, formula feeding showed a net benefit in terms of preventing MTCT of HIV and infant deaths (Mbori-Ngacha et al., 2001; Nduati et al., 2000). Studies that followed contradicted these results, and they have not been replicated since (Young et al., 2011). Eastman et al. (2002) argued that the Kenya study's analytical strategy was problematic, since the breastfeeding group also included mothers who practiced mixed feeding. The MASHI study conducted in Botswana showed that formula feeding from birth did not reduce the risk of transmission compared with breastfeeding in combination with zidovudine – a type of antiretroviral medication. Similarly, a study conducted in Côte d'Ivoire reported that HIV-infection was not reduced and uninfected child mortality increased amongst infants who were in the formula feeding group (Becquet et al., 2007). In both studies, considerable support was

provided to ensure the safety of formula feeding amongst the participants. The increased rate of child mortality, even in clinical research settings that support participants to practice safe replacement feeding, challenged the benefits of formula feeding for HIV-positive mothers and their infants (Kuhn et al., 2009).

The first study to report that EBF could prevent HIV-transmission was conducted in Durban, South Africa. In 1999, Coutsoudis et al. reported that the risk of vertical transmission of HIV while breastfeeding exclusively was significantly lower than the risk associated with mixed feeding (Coutsoudis et al., 1999). The finding was confirmed by studies conducted in Zimbabwe (Iliff et al., 2005) and Côte d'Ivoire (Becquet et al., 2005). Two additional studies (Coovadia et al., 2007; Kuhn et al., 2007) observed significant reductions in HIV transmission with EBF, even after adjusting for many confounding factors. Furthermore, studies reported that exclusively breastfed infants had lower non-HIV morbidity and mortality rates compared to mixed fed HIV-exposed infants (Piwoz et al., 2007; Taha et al., 2006). The absolute risk of postnatal transmission of HIV through breast milk varies between 10-20% (Becquet et al., 2009; De Cock et al., 2000; Leroy et al., 1998; Miotti et al., 1999; Nicoll, Newell, Peckham, Luo, & Savage, 2000). There is a robust evidence base that associates the practice of mixed feeding with higher rates of vertical transmission and infant morbidity and mortality compared to EBF (Chopra, Doherty, Goga, Jackson, & Persson, 2010; Coovadia et al., 2007; Kuhn et al., 2007; Rollins et al., 2008; Thior et al., 2006). These findings have supported the recommendation of EBF for HIV-positive mothers (Iliff et al., 2005; Rollins et al., 2008; Ross & Labbok, 2004), given the challenges to ensure safe replacement feeding (Bland et al., 2007; Doherty et al., 2007).

2.4.2.4 EBF for HIV-positive mothers in LMICs. With increasing recognition that replacement feeding is neither affordable, feasible, and most importantly not safe in LMICs, policies have focused on ways to make breastfeeding safer for HIV-exposed infants (Kuhn et al., 2009). In 2003, a joint framework for priority action was developed within the context of the WHO's Global Strategy on Infant and Young Child Feeding in order to create an environment that encourages appropriate feeding for all infants in the context of HIV. As part of the strategy, HIV-negative women and women of unknown status are advised to breastfeed exclusively for the first six months, while continuing breastfeeding up to 24 months or beyond (WHO, 2003a). HIV-positive mothers are also encouraged to practice EBF for six months in situations where replacement feeding does not meet AFASS criteria. The strategy also emphasised that all HIV-infected mothers should be provided with information about the risks and benefits of various feeding options and guided to select a feeding option most appropriate in their individual circumstances (WHO, 2003b).

Given the relatively low risk of transmission during EBF compared to mixed feeding, researchers and policy makers assumed that abrupt cessation of EBF would be the ideal practice for HIV-positive mothers as opposed to mixed feeding after six months (Kuhn et al., 2009). Mothers who chose EBF were therefore advised to stop breastfeeding immediately when her situation allowed it (WHO, 2003b). However, research studies from sub-Saharan Africa reported high rates or mortality after abrupt weaning and that there was no benefit of abrupt cessation of breastfeeding (Kuhn et al., 2008; Taha et al., 2006; Thior et al., 2006). In 2006, the WHO changed their policies from recommending cessation of breastfeeding as soon as feasible to recommend weaning only once AFASS breast milk substitutes and complimentary foods could be obtained (WHO, 2006).

2.4.2.5 EBF and antiretroviral treatment. In 2010, the WHO revised its guidelines on HIV and infant feeding again to recommend a public health approach that advised governments to promote and support one feeding practice to all women living with HIV. The updated guidelines also advised that HIV-positive mothers should continue breastfeeding infants until 12 months of age and only then consider stopping (WHO, 2010). Abrupt breastfeeding cessation is no longer advisable, and mothers who decide to stop breastfeeding at any point after six months should do so gradually over the period of one month. The WHO also for the first time recommended antiretroviral drug interventions to prevent postnatal transmission of HIV through breastfeeding (WHO, 2010). More recently, studies have demonstrated that antiretroviral interventions to the mother or child further decrease the risk of HIV-transmission through breast milk (Young et al., 2011). A number of clinical trials conducted in several African countries provided strong evidence that antiretroviral treatment (ART) significantly reduced the probability of HIV-transmission. These studies include the BAN study in Malawi (Kumwenda et al., 2008), the DREAM study in Mozambique (Marazzi et al., 2011), Mma Bana Studies in Botswana (Shapiro et al., 2010), Mitra study in Tanzania (Kilewo et al., 2009) and the Kesho Bora studies in South Africa, Burkina Faso and Kenya (Kesho Bora Study Group, 2010). In all of these studies the transmission rate was less than 5% in breastfeeding women who received ART during pregnancy and post-partum, compared with a transmission rate of 20-45% in the absence of interventions (WHO, 2016b). In 2016, guidelines on HIV and infant feeding were updated once more to recommend that mothers living with HIV should breastfeed for at least 12 months and may continue breastfeeding for up to 24 months, as in the general population (WHO, 2016c). The WHO also emphasises that mothers should be fully supported for ART adherence, preferably life-long ART adherence instead of antiretroviral drug prophylaxis as in the 2010 guidelines.

2.4.3 Infant feeding policies in South Africa. The first South African PMTCT guidelines by the National Department of Health included free formula milk provisions to HIV-exposed infants through public health facilities (Department of Health, 2001; 2002). Replacement feeding by HIV-positive mothers was recommended when it was acceptable, feasible, affordable, sustainable and safe (AFASS criteria), in accordance with the WHO feeding guidelines (WHO, 2001). To address the local social, cultural and economic variations, HIV-positive mothers who opted not to breastfeed continued to receive free formula milk from health facilities (Doherty et al., 2003). However, interpretation of the AFASS criteria was problematic (Buskens et al., 2007; Doherty et al., 2006a; Leshabari, Blystad, & Moland, 2007), and many women who initially chose replacement feeding resorted to mixed feeding. In a study conducted by Bland and colleagues (2007) with 1253 HIV-infected and 1238 uninfected women in a largely rural population in South Africa, only 3% of HIV-infected women had access to all four resources required to facilitate safe replacement feeding. Similarly, an assessment of appropriate feeding among HIV-infected mothers in South Africa indicated that 67.4% of women who intended to formula feed did not meet all the criteria and therefore made an inappropriate choice (Doherty et al., 2007). To assess the safety and adequacy of infant formula feeding among HIV-positive mothers in a peri-urban area of KwaZulu Natal, Andresen et al. (2007) collected samples from feeding bottles to analyse the contents, and found that 67% of samples obtained at the clinic and 81% of available home samples were contaminated with faecal bacteria.

In 2007 South Africa released its Infant and Young Child Feeding Policy, with recommendations for HIV-positive women based on the WHO's 2006 guidelines on HIV and infant feeding (Department of Health, 2007). HIV-positive women were advised to practice EBF for six months unless AFASS criteria made replacement feeding possible. The 2010 national PMTCT guidelines incorporated the evidence on EBF and ART through

provision of highly active antiretroviral therapy (HAART) for mothers or nevirapine prophylaxis for infants for the duration of breastfeeding. The 2010 PMTCT guidelines were broadly supportive of HIV-positive women breastfeeding their infants, but still did not adopt breastfeeding as the programme's default feeding choice (Kuhn & Kroon, 2015). Furthermore, the continued provision of free formula milk in the South African 2010 PMTCT guidelines hindered the promotion of EBF (Doherty et al., 2011).

In 2011, policies were shifted to provide full support for breastfeeding by all mothers. The Department of Health removed free formula milk from the PMTCT programme in 2011(Department of Health, 2011). The Tshwane Declaration in August 2011 pledged to promote, protect and support breastfeeding generally, and adopted breastfeeding as the default feeding method for HIV-exposed infants (Department of Health, 2012b). The Tshwane Declaration was followed by the promulgation of regulations (R991/2012) to enforce the international code on marketing of breast milk substitutes and the 2013 revised Infant and Young Child Feeding Policy further helped to put breastfeeding back on the agenda, supporting EBF for six months for both HIV-infected and uninfected mothers (Department of Health, 2012b, 2013). The government's current feeding policy recommends that HIV-positive mothers continue breastfeeding for 12 months with appropriate complimentary feeding after six months whilst taking ART as prescribed (Kuhn & Kroon, 2015). HIV-negative mothers should breastfeed for up to two years and beyond with appropriate complementary feeding (Department of Health, 2013). Nevertheless, South Africa still falls behind in the uptake and duration of EBF compared to other African countries (Sziba, Jerling, Hanekom, & Wentzel-Viljoen, 2015).

Despite the country's recent increased efforts to promote EBF, feeding a combination of breast milk, formula milk and solid foods remains the norm in South Africa, even for infants much younger than six months. (Buskens et al., 2007; Goosen, McLachlan,

& Schubl, 2014, Sziba et al., 2015). A study conducted in an HIV-prevalent rural district of KwaZulu-Natal showed that of 96% of mothers who initiated breastfeeding at birth, 76% practiced mixed feeding at three months after birth (Ghuman, Saloojee, & Morris, 2009). Results from a study conducted at three routine PMTCT sites in South Africa indicated that EBF at three months was low, with 7.2% and 2.8% amongst breastfeeding HIV-positive and negative women respectively (Goga et al., 2012). While the latest guidelines emphasise a public health approach to increase effectiveness and reach, the challenge remains to translate this evidence into practice, as many mothers still practice mixed feeding (Ndubuka, Ndubuka, Li, Marshall, & Ehiri, 2013). Increasing EBF rates in a culture where mixed feeding has become the norm requires engaging with complex social, cultural and structural barriers (Eamer & Randall, 2013; Lazarus et al., 2013; Saloojee, & Cooper, 2010).

2.5 Determinants of Breastfeeding

An understanding of the determinants of a specific behaviour is important in the design of an effective intervention to encourage behaviour change (Livingood et al., 2011). According to the WHO, nearly all women are biologically capable of breastfeeding, with the exception of very few with severely limiting medical disorders (WHO, 2009). The notion that women have the inherent capacity to breastfeed suggests that breastfeeding is a matter of individual choice and rational decision-making, dependant on the willingness, or determination, of the mother (Schmied & Lupton, 2001). Within this discourse, understandings about optimal infant feeding are framed as facts that women need to be informed about (Wall, 2001), while breastfeeding problems are framed as challenges to be managed individually with advice from health care professionals (Carter, 1995). A large number of breastfeeding interventions have focused on educating, counselling and supporting individual women to encourage breastfeeding (Britton, McCormick, Renfrew,

Wade, & King, 2007; Chung, Gowri, Trikalinos, Joseph, & Stanley, 2008). These interventions usually involve a cognitive model of decision-making where pros and cons are weighed up to encourage behaviour change. This approach implies that women will make the right decision if they are well-informed about the benefits of breastfeeding (Jansson, 2009). Despite its biological origins, the act of breastfeeding does not always come naturally and a large number of women experience major difficulties with breast milk production and the process of breastfeeding (UNICEF, 2016). Research applying traditional decision-making theories, such as the Theory of Reasoned Action and the Theory of Planned Behaviour to predict breastfeeding outcomes, has been used with limited benefit (Sheehan, Schmied, & Barclay, 2010). This strategy reduces the problem to be one of information and intention while largely ignoring the needs of the mother, the context in which infant feeding takes place and the wider range of concerns that breastfeeding women face (Kukla, 2006).

2.5.1 Discourses on breastfeeding. The majority of the literature presents breastfeeding in biomedical and public health terms, with a major focus on the associated health benefits for the infant (Marshall, Godfrey, & Renfrew, 2007; Schmied & Lupton, 2001; Wall, 2001). The literature review conducted for this study confirms the dominance of a biomedical discourse which emphasises the policy ideal of EBF in terms of the benefits involved for the infant and society. In the literature, breast milk is commonly constructed as the gold standard of nutrition that improves infant health and bonding (cf. UNICEF 2016), while infant formula is constructed as sub-optimal, contributing to infant illness and even death (Sankar et al., 2015). Within this biomedical discourse, infant feeding is also framed in terms of associated costs to the health care system (cf. Rollins et al., 2016). Through the frame of health care costs and prevention, Wall (2001) argues that a mother who chooses not to breastfeed is placing her infant's life at risk and places her commitment

to "good mothering" in question. Since it is only the mother who can breastfeed, the blame and potential for associated guilt also falls to the mother if she deviates from this "best practice" (Williams, Kurz, Summers, & Crabb, 2012). However, infant feeding decision-making and behaviour are not simply a choice between health and risk, or a planned behaviour (Hoddinott, Craig, Britten, & McInnes, 2012). The act of breastfeeding is not simply about meeting the nutritional needs of infants, but includes social, emotional, sexual and cultural meaning for mothers, family members and for those within the wider social and cultural context (Maher, 1992). According to Marshall and colleagues, the dominant focus on the biomedical and health aspects of breastfeeding neglects the lived experiences of the mothers themselves, the diversity of family structures, child-raising practices, the socio-cultural meanings and context (Marshall et al., 2007).

2.5.2 Psychosocial, cultural and contextual determinants of EBF. Social and cultural expectations are powerful determinants of breastfeeding patterns (Favin & Baume, 1996). Breastfeeding goes far beyond the purely physical process of producing milk and transferring that milk to the infant (Spencer, 2008). It goes beyond the personal relationship between a mother and an infant, and requires a wider network of support from families, communities, workplaces and the health system to make breastfeeding possible (Haroon, Das, Salam, Imdad, & Bhuttha, 2013; UNICEF, 2016). As a result, various factors undermine a woman's ability to adhere to EBF. Psychosocial and circumstantial factors affecting both the mother, the infant and family may alter breastfeeding intention, initiation and continuation (Bai, Wunderlich, & Fly, 2011). The second paper in the 2016 Lancet Series on Breastfeeding provides a review of the determinants of breastfeeding and how these determinants operate at multiple levels to affect breastfeeding decisions and behaviours over time (Rollins et al., 2016). The review confirms that breastfeeding practices

are affected by a wide range of historical, socio-economic, cultural and individual factors.

Psychosocial factors such as self-efficacy, postpartum depression and maternal breastfeeding intentions affect breastfeeding duration (de Jager, Skouterkis, Broadbent, Amir, & Mellor, 2013). A woman's level of breastfeeding self-efficacy is strongly related to EBF duration and experiencing early breastfeeding difficulties is negatively related to both breastfeeding self-efficacy and EBF duration (Blyth et al., 2002, 2004; Kronborg and Vaeth, 2004; Scott, Binns, Oddy, & Graham, 2006). The literature on infant feeding indicates that pressure from family members (Bezner Kerr, Laifolo Dakishoni, Shumba, Msachi, & Chirwa, 2008; Otoo, Lartey, & Perez-Escamilla, 2009; Sibeko, Coutsoudis, Nzuza, & Gray-Donald, 2009), lack of support (Britton et al., 2007; Brown, Dodds, Legge, Bryanton, & Semenic, 2014), cultural beliefs and traditions (Buskens et al., 2007; Kakute et al., 2005; Wells, 2006) and conflicting messages about feeding practices from different sources (Chisenga et al., 2011; Tuthill et al., 2013) affect feeding choice and practice. Studies conducted in a number of African countries have highlighted the important roles played by grandmothers in particular to introduce other liquids and foods (Bezner Kerr et al., 2008; Buskens et al., 2007; Doherty et al., 2006a; Ijumba et al., 2014) and that pressure from ill-informed family and friends may lead to the early cessation of breastfeeding (Ghuman et al., 2009; Kakute et al., 2005; Mamabolo et al., 2004; Mushapi et al., 2008; Sibeko et al., 2005). Traditional advice from family members create conflicts with instructions from health care workers (Fjeld et al., 2008; Østergaard & Bula, 2010). According to Kroeker and Beckwith (2011), new mothers may feel uncomfortable contradicting elders and may remain silent about recommendations received at the clinic, especially if they form part of a hierarchical family structure. For mothers living with HIV, studies have shown that going against community norms of feeding prompts questions about mothers' HIV status, unwanted disclosure and fear of stigma from partner's family and

community (Doherty et al. 2006a; Perez et al. 2004). Thus, in addition to the threat that HIV poses to child survival, it also affects the cultural conditioning and social relationships of HIV- infected women (Chikonde, Hem, & Sundby, 2012).

Furthermore, mothers may be challenged by structural or environmental barriers to breastfeeding at the hospital, home or work place (Cattaneo, 2012; Haroon et al., 2013; Ogbuanu, Glover, Probst, Liu, & Hussey, 2011). The health system and advice from health-care providers influence and support feeding decisions at key moments that may help maintain exclusive and continued breastfeeding (Labbok & Taylor, 2008). Practical factors such as travelling away from home, separation from the infant and available formula or food supplies also play an important role in determining feeding practices (Coutsoudis et al., 2008; Goosen et al., 2014; Sheehan et al., 2010). According to Smith (2004), breastfeeding competes with women's other paid and unpaid work activities, and with commercially marketed baby food products, for maternal time and money resources. There is a real need for societal sharing of the time costs of EBF and infant care in order to relieve time pressures on new mothers within households. (Smith & Forrester, 2013). EBF rates improve significantly – by 152% - when breastfeeding interventions are delivered concurrently in the health systems and community environment (Sinha et al., 2015). Increasingly there has been a demand to integrate structural, social and contextual factors when designing and conducting research that aims to promote behaviour change (Ijumba et al., 2014). A recent systematic review of breastfeeding interventions supported the validity of more complex, adaptive systems that engage multiple sectors and actors and provide support in different settings in order to improve feeding practices (Sinha et al., 2015). In order to clarify the complex network of factors that determine breastfeeding, a general systems theory approach, in which the elements are seen as interacting dynamically, offers a possible explanatory model.

2.6 Theoretical Framework

2.6.1 A general systems theory approach. General systems theory (GST) describes how elements, whether physical, psychological or social, interact dynamically. The elements constitute a system that is constantly in exchange with the structure within which it operates. A system is made up a set of functions which, as a whole, produces a particular output. The output is influenced by events within the system and the feedback processes between the system's internal elements and the environment (Glenister, 2011). The theory suggests that when elements interact, this interaction is never removed from the context (or environment) where the interaction takes place. Initially conceptualised by von Bertalanffy (1972), GST developed as a response to the need for communication across various disciplines and the development of tools useful for discussions about the general relationships of the empirical world. In keeping with its name, GST provides a general theory that can be applied to any system, regardless of the properties or elements of the system. A general systems approach views the world in terms of integrated systems that have multiple and overlapping purposes. It aims to distinguish (a) the purpose of a system, (b) the purpose of its parts, and (c) and the dynamic interactions among them. Though it grew out of organismic biology, GST can provide a platform for an integrated study of the complexities in human experience (Boulding, 1956; Friedman & Neuman Allen, 2011). It focuses attention on the system as a whole, without overlooking the complex interrelationships among its constituent parts, or the feedback processes that occur both within and between systems (Cordon, 2013). For this reason, GST can be useful to model complex intrapersonal, interpersonal, intergroup, and human interactions without reducing phenomena to the level of individual stimuli (Laszlo & Krippner, 1998). Figure 2 provides an example of a general system and its components.

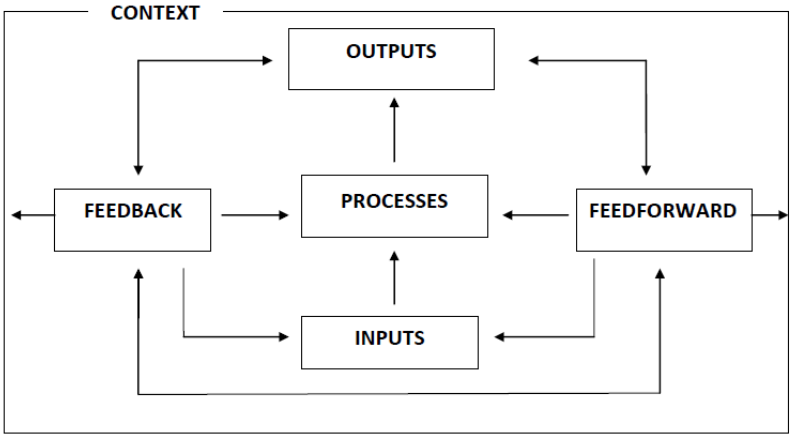

Figure 2: A general system and its components

2.6.2 A systems analysis of breastfeeding. In light of the variety of factors that influence breastfeeding, a general systems framework assists to clarify the mechanisms by which these factors act to enable or impede the practice of EBF. Bentovim (1976) developed a general system framework to help understand and explain breastfeeding behaviour. His diagram of breastfeeding as a social system (Appendix A) acknowledges the diverse range of physical, psychological and sociological factors that influence the choice and continuation of breastfeeding. These factors do not function in isolation, but interact dynamically to influence infant feeding behaviour. Individual variables relating to the mother and her characteristics, such as a desire to breastfeed and her beliefs about the value of breast milk, determine if she chooses to initiate breastfeeding. If these variables allow a mother to choose breastfeeding, her ability to act on this decision will be dependent on the broader cultural, social and economic context. If breastfeeding is attempted, this itself has consequences for the mother, for the infant and for the family, while further establishing breastfeeding as a normative practice in the community. Such consequences "feed back" and influence the original variables and the whole system can be seen to be in dynamic interaction (Bentovim, 1976). Processes of "positive feedback" between the system and the

environment encourage breastfeeding, while "negative feedback" diminishes the process and increase the chances of substitution with formula milk or complimentary foods (p. 160). Based on these feedback processes within the system, permanent changes (what Bentovim calls 'morphogenic processes') occur which energise the system and ensure the continuation and future use of breastfeeding by the individual and society. The usefulness of a system approach is that it may offer a way of planning interventions and indicate key times for strategic attempts to alter individual and societal attitudes and behaviour (Bentovim, 1976).

2.7 Conclusion

Despite the substantial body of research on the value of EBF and strategies to promote and support EBF for all mothers, mixed feeding has persisted as the normative feeding practice in South Africa. This raises questions about the broader social constructs that underlie feeding practices, and the interplay of factors that may influence a mother's ability to breastfeed. Intervention is necessary at many levels – societal, family and individual – if breastfeeding and particularly EBF is to be re-established as the feeding method of choice. Research is needed to determine how factors on all levels contribute to prevent or motivate mothers from choosing EBF. This is needed for both HIV-infected and uninfected mothers in South Africa, where suboptimal breastfeeding carries high risks for infants in both groups. While there has been a great deal of research on the HIV-infected mother and EBF, less is known about mothers who are uninfected and reside in communities with high HIV-prevalence rates. My study therefore aims to contribute to the literature by examining how personal, cultural and contextual factors interact to promote or impede EBF for HIV-infected and uninfected mothers. The next chapter will describe the methodology that was used to conduct this study.

Chapter 3
Methodology

3.1 Introduction

This chapter describes the setting of the study and the research design. It includes a detailed discussion of the recruitment process, training of interviewers, data collection procedures and ethical considerations. Lastly, the chapter outlines the method of data analysis and the strategies that were used to enhance the trustworthiness of the research.

3.2 Study Setting

The research for this thesis was completed as part of a larger study conducted in South Africa and Nigeria by McMaster University (Canada), the University of Cape Town and Stellenbosch University (South Africa). The INFANT study had two broad aims. The first was an investigation of the immunological properties of breast milk of HIV-positive women, while the second was an exploration of what motivates or prevents HIV-infected women with uninfected infants to practice EBF (Rosenthal, 2010). The data for this thesis were collected from the South African arm of the larger study and focused specifically on two local community sites with high HIV prevalence rates. Zithulele is situated in the rural OR Tambo district in the Eastern Cape, while Khayelitsha is located on the outskirts of Cape Town in the Western Cape. Although one community is classified as rural and the other as peri-urban, both face severe public health challenges related to HIV, malnutrition and diarrhoea (Massyn et al., 2013). Each study site is described in more detail below.

3.2.1 Zithulele. Zithulele is located in one of the poorest rural areas in South Africa (Baleta, 2009). Unemployment is estimated to be approximately 77% and the average income is less than R1000 per household per month. Only 9% of households have access to

electricity and a little over a quarter to piped water. Over 15% of people live more than an hour from their nearest clinic, while over 35% live more than an hour from the nearest hospital (http://www.zithulele.org/location). Antenatal surveys have shown an HIV-prevalence rate of 29% in the district, and 21% in the Zithulele community (Gaunt, 2010). Zithulele Hospital is a deeply rural district hospital in the area that provides services to a population of 130 000 people. Due to HIV/AIDS, acute diarrhoea and malnutrition, the hospital encourages all mothers to exclusively breastfeed their infants from birth up to six months of age (Malan, 2011). In 2008, 99.8% of women who gave birth at the hospital were aware of their HIV status at delivery (Gaunt, 2010).

3.2.2 Khayelitsha. Khayelitsha ("new home" in isiXhosa) is a large township with over 500,000 inhabitants, located on the outskirts of Cape Town. Residents are largely Xhosa speakers who have migrated from the Eastern Cape and other rural areas (Hilderbrand et al., 2003; Rotherham-Borus et al., 2011). The unemployment rate is estimated to be around 38%, and 74% of households have a monthly income of less than R3200 (Statistics South Africa, 2013). Neighbourhoods contain both formal settlements (government housing with onsite water and sewage) and informal settlements (shacks or temporary structures that rarely have water or access to sanitation on the premises). HIV prevalence in Khayelitsha is 16% (Garone et al., 2011). Estimates from a public sector delivery unit suggest that 30-32% of deliveries are to HIV-infected mothers (Rosenthal, 2010).

3.3 Research Design

The study used a qualitative research design to explore factors that enable or prevent mothers from adhering to EBF. Since the many influences on infant feeding choices are

complex and difficult to quantify (Zulliger et al., 2013, Sheehan et al. 2010), exploring mothers' attitudes and normative influences provides critical information for addressing perceived barriers to EBF adherence. A qualitative approach allowed for a more nuanced understanding of the diverse influences on infant feeding intention and practice.

Individual interviews and focus group discussions were used to collect data for the analysis. These methods provide participants with the opportunity to talk freely about their personal feelings, opinions and experiences using their primary language (Worthman et al., 2016). Open-ended questions made it possible to gain insight into an issue that is sensitive, complex and not easily accessible through filling in questionnaires or confining participants to yes/no answers (Ijumba, 2014). Using in-depth interviews and focus groups to study infant feeding practices in the context of HIV is in keeping with the design used by authors who conducted similar research in South Africa (Doherty et al., 2006a; Doherty et al., 2006b; Ijumba et al., 2013; Sibeko et al., 2005) and elsewhere in sub-Saharan Africa (Fjeld et al., 2008; Kakute et al., 2005; Østergaard & Bula, 2010).

Interviewers were trained to use semi-structured interview guides to explore each participant's narrative on infant feeding choice and practice. The interviewers used the participants' responses to probe where further clarification or elaboration was required, or as a catalyst for further discussions of the relevant issues. The in-depth format enables the interviewer to explore fully the reasons, feelings, beliefs and opinions that underpin individual participants' responses (Legard, Keegan & Ward, 2003). Since infant feeding is not only personal, but rooted in the cultural and social norms of the community (Buskens et al., 2007; Ijumba et al., 2013), focus group discussions were conducted to bring attention to community norms that have bearing on the topic (Forrester, 2010). Participants in a focus group build on each other's ideas and comments which provides insight into collective

meanings (Kitzinger, 1995). Using in-depth interviews and focus groups to collect the data and compare across data collection methods enhances the credibility of the research findings through triangulation.

The aim of the interviews and focus groups was to explore factors which prevent or motivate mothers from adhering to EBF. Semi-structured interview guides were developed to help direct the interviews (Appendix B) and focus group discussions (Appendix C). I developed a semi-structured interview guide and received input from Prof Mark Tomlinson and Dr Jackie Stewart who were involved in the larger research study. The guides were based on the aims of the study and drew on areas of interest identified through a review of the literature on infant feeding in low-resource settings. This included probes about the participant's reasons behind her chosen method of feeding and the perceived benefits or challenges associated with her feeding practice. The interview guide also included questions about the participant's knowledge, perceptions and experiences of infant feeding, growth and illness, as well as HIV transmission and infection.

3.4 Participants

3.4.1 Recruitment of participants. Participants were recruited using a purposive sampling method. This method obtains a sample of participants who match specific criteria that best meet the purposes of a study (Bless, Higson-Smith, & Kagee, 2006). Purposive sampling is suitable for qualitative studies where the researcher is interested in informants with relevant, personal experience and valuable knowledge on the topic (Guthrie, Yongvanich & Ricceri, 2004). Mothers with infants between three and four months of age were recruited, regardless of her current feeding practice, from the two study sites. This age range was selected, since studies have shown that mothers in South Africa who stopped breastfeeding or who introduced complimentary foods have done so before or around the

time an infant turns three months old (Department of Health, Medical Research Council, & Measure DHS, 2002; Goosen et al., 2014; Mamabolo et al., 2004). Conducting interviews with mothers of infants in this age range can provide insight into the challenges that result in breastfeeding cessation or reasons for introducing other foods. For the same reason, eligibility criteria did not require that mothers practice EBF at the time of recruitment, or at the time of the interview. The study included mothers in all feeding categories (exclusive breastfeeding, predominantly breastfeeding, formula feeding, and mixed feeding) in order to gain a better understanding of the factors that influence mothers in these communities to feed their infants in a specific way.

For participants to be eligible to take part in the study, they had to (1) live in Zithulele or Khayelitsha, (2) have an infant between the ages of three and four months of age in their care, and (3) be the biological mother of that infant. Data collectors recruited participants from two existing community research programmes that service the study communities.

3.4.1.1 Zithulele. Participants were recruited using the database of the Zithulele Births Follow-Up Study (ZiBFUS), an ongoing study designed to gather information about infants in the first year of life in Zithulele and neighbouring regions of the Eastern Cape (http://www.zibfus.org/).

3.4.1.2 Khayelitsha. Participants were recruited through the Prevention Research for Community Family and Child Health unit as part of the broader INFANT study (Rosenthal, 2010). Recruiters went door to door in three neighbourhoods (Ndlovini, Harare and Makaza) and invited mothers from the community with infants within the specified age range to participate in the study.

3.4.2 Sample size. According to Guthrie et al. (2004), saturation of data is the most appropriate way to determine the optimal sample size. Recruitment ended when no new topics or issues seemed to be introduced or discussed in the interviews. Since data collectors interviewed mothers regardless of feeding mode, subgroups formed within the study population based on different feeding methods (exclusive breastfeeding, formula feeding or mixed feeding). As a result, a wider range of issues, related to the different feeding practices, were discussed by the participants and increased the number of interviews needed to reach saturation. A total of 53 participants were recruited and interviewed individually. In addition to in-depth interviews, data collectors conducted small focus groups with seven groups of 3-5 women (n = 32). Although smaller focus groups may risk difficulties in sustaining discussions, smaller groups can be useful because it allows more time for each participant to talk and are generally easier to manage (Morgan, 1997). Figure 3 shows the composition of the study sample.

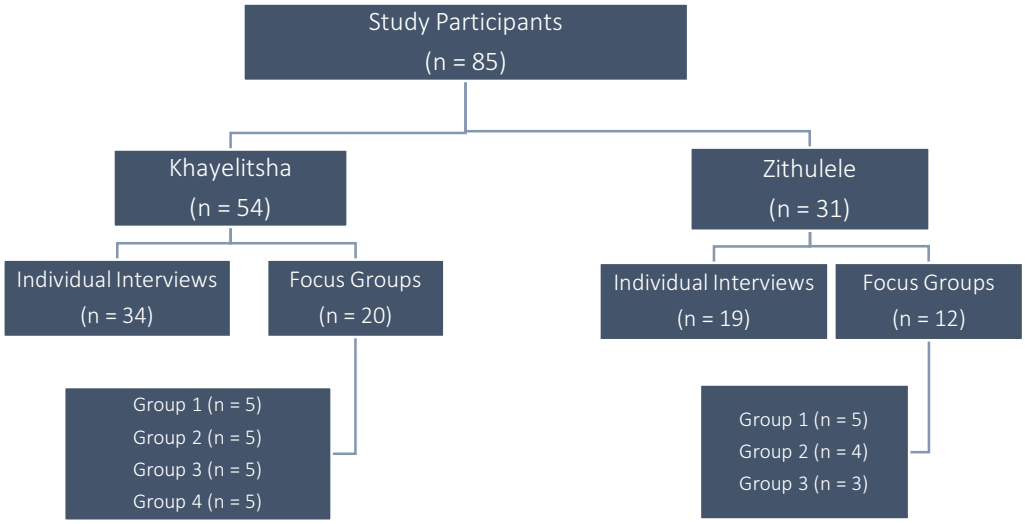

Figure 3. Size and composition of the study sample

3.5 Data Collection

Data collection for the study took place between May and October 2013, with assistance of local professional programme staff at Philani in Zithulele and the Prevention Research unit in Khayelitsha. I was present for data collection at both study sites to oversee the research procedures. The research team implemented the procedure based on the guidelines provided in the Data Collector's Field Guide (Family Health International, 2005).

3.5.1 Preparation. Data collectors were trained and the interviews were piloted prior to data collection. One data collector in Zithulele and two data collectors in Khayelitsha were trained to conduct the interviews and focus groups. Data collectors conducted either one or two practice interviews.

3.5.1.1 Training. Although all three data collectors had experience in quantitative data collection, in-depth, open-ended interviewing was a new and unfamiliar concept. Training and supervision was therefore an essential part of the data collection process. I compiled a training manual and schedule to use for the training and supervision of the data collectors. The training process was overseen by Prof Mark Tomlinson, and included valuable input from Prof Ashraf Kagee and Dr Brownwyne Coetzee at Stellenbosch University, both experts in qualitative interviewing techniques involved in the larger INFANT study.

The data collector in Zithulele received three days of one-on-one training in qualitative interviewing and important techniques, followed by role-play and feedback sessions. In Khayelitsha, I presented a five-day training course with the data collection team at the Prevention Research centre, overseen by Dr Jackie Stewart from Stellenbosch University. After a series of exercises and role-play sessions, two data collectors were

selected from the larger team who were deemed most skilled to conduct the research for the study. After having reviewed transcripts from the initial interviews, we decided that only one of the data collectors would continue with the interviews.

3.5.1.2 Translations. The interview guides and consent forms were translated into isiXhosa, as this was the primary language in both communities. Two research staff members who were both fluent in English and isiXhosa translated the guide into isiXhosa. The two versions were compared and discussed so that they reached an agreement on any discrepancies in order to prepare the final edit. This version was piloted in Zithulele to determine if any questions needed further adjustment. The revised version of the interview guide was used to collect the data at both study sites. A research staff member also translated the consent forms from English into isiXhosa (Appendices D, E, F, G). Stellenbosch University's Language Centre conducted a comparative edit to verify that the content remained unchanged after translation (Appendix H).

3.5.1.3 Pilot interviews. The pilot interviews conducted by data collectors served two purposes. First, they helped to determine whether the interview questions were suitable to answer the research questions (Morrow, 2005). Second, they provided the data collectors with opportunities to practice qualitative interviewing techniques and become familiar with the interview guide. In Zithulele, the newly trained interviewer conducted two pilot interviews at Zithulele Hospital. Based on the feedback from these interviews, questions were added about sex and breastfeeding and the use of traditional medicine. Each interviewer in Khayelitsha conducted one pilot interview at the Prevention Research centre in Khayelitsha to help prepare them for the actual interviews.

3.5.2 Interviews and focus group discussions. The interviews were conducted at a time suitable for participants either at their home, at the Philani office in Zithulele or at the Prevention Research centre in Khayelitsha. On arrival, the participants received the information sheet and consent form. The purpose and the confidential nature of the interview was verbally explained in isiXhosa to the participant by the interviewer. The interview was conducted only upon receiving written consent. Interviews lasted between 40 and 80 minutes, while focus group discussions lasted between 60 and 90 minutes. The interviews and focus groups were audio recorded with the permission of the participants.

At the end of individual interviews and focus groups, there was a debriefing between the research team members to discuss the most important themes and possible differences from previous interviews or focus group discussions. Since all interviews were conducted in isiXhosa, the daily review of data was based on the feedback and reflection given by the interviewers.

3.5.3 Data management. The audio recorded interviews were translated from primary language into English and transcribed in a Microsoft Word document. Participants were assigned a code that denoted the data collector who conducted the interview, the participant's identification number, the study site, the participant's feeding practice at the time of the interview and HIV status (e.g. V01_KHA_EBF_HIV+). In focus group discussions, the code denoted the group participant's identification code, the group number and the study site where the focus group discussion took place (e.g. M01_FGD1_KHA). For some focus group discussions, the transcriber could not distinguish between participants within the groups by listening to the audio, and these cases were identified with an asterisk (e.g. M0*_FGD_ZIT). All personal identifying information about the participant was removed from the transcriptions. The interviews were saved in a plain text format and

entered into the ATLAS.ti software programme, which assisted with the thematic analysis of the transcriptions.

3.6 Ethical Considerations

3.6.1 Ethical clearance. Ethical clearance for the study was received from the Human Research Ethics Committee (HREC) at Stellenbosch University (reference number: N12/05/021). Ethical clearance for 2012 to 2013 was first obtained (Appendix I), followed by re-certification for 2013 to 2014 (Appendix J). The activities outlined in this research are covered by this ethical clearance.

3.6.2 Confidentiality and anonymity. Interviewers explained the nature of the study to all participants in private. During the informed consent process, all participants were informed that their input would be entirely confidential, that their names would not be made public in any way and that the research team were the only ones who would have access to the interview material. Participant names were omitted from the study data and replaced with identification codes to protect each participant's right to anonymity. Only designated staff had full access to the participants' information that was stored in a secured area.

3.6.3 Informed consent procedure. Most of the ethical considerations were addressed through the process of informed consent. The purpose and the confidential nature of the interview were presented to the participants in isiXhosa by the interviewer. All participants invited to take part were informed that their participation was entirely voluntary and that they had the right to withdraw from the study at any time. It was also explained to them that there would be absolutely no consequences should they wish not to participate. The interview included questions about sources of HIV information, the participant's

feelings about HIV and breastfeeding, and self-reported HIV status. The interviewers explained to the participants that the interview included sensitive questions about breastfeeding and HIV, and participants were assured that disclosure on the topic was in no way compulsory. Lastly, they were informed about the intended use of an audio recorder to tape the interviews or focus group discussions, in order for data to be transcribed and analysed.

After informing the participants of the interview content and process, they were asked to verbally confirm their participation. Once they confirmed that they wished to participate in the study, they were asked to sign the informed consent form, indicating that they understood what had been explained to them. Only upon receiving written consent, the interview was conducted. Participants received a copy of the consent form with the contact details of Prof Ashraf Kagee, a co-principal investigator on the study, in case they wished to discuss any aspect of the study at a later time.

3.6.4 Participant incentives. As an expression of gratitude, all participants were compensated for their time. In Zithulele, participants received a R30 airtime voucher. This amount was in accordance with incentives from other research projects in the area, as giving more than the other projects could result in comparisons and discussions in the community about unequal research incentives. Participants were compensated for their travel expenses in cases where interviews took place at the Philani Office. In Khayelitsha, participants received a R100 grocery voucher as well as transport to and from the research office. This was also in line with other studies conducted through the Prevention Research centre. The decision to provide different incentives for each study site was approved as part of the ethics application to the HREC.

3.6.5 Referral procedures. Since the interview guide included sensitive questions about the challenges of infant health, motherhood and HIV, referral procedures were put in place to deal with any serious issues that arose from the interviews. The referral procedures were established prior to data collection, in keeping with other research studies conducted in collaboration with Philani. After the interviews and focus groups, participants were presented with the opportunity to ask any questions they might have. Two participants from Khayelitsha and one participant from Zithulele were referred following concerns that arose during their interviews.

3.7 Data Analysis

Qualitative data from the interviews and focus group discussions were analysed using thematic analysis. Thematic analysis is a systematic yet flexible method for "identifying, analysing and reporting patterns (themes) within the data" (Braun & Clarke, 2006, p. 79). This method of analysis was suitable for the study since the aim was to understand which factors motivate or prevent mothers from adhering to exclusive breastfeeding practices, and why this occurs. I used ATLAS.ti software to assist with the thematic analysis of the transcriptions, while following the process of encoding data as outlined by Braun and Clarke (2006). ATLAS.ti is a computer programme that manages large amounts of text through linking and search functions so that the investigator can organise and analyse the textual data with more ease (Henning, van Rensburg, & Smit, 2004).

3.7.1 Coding the data. For the initial coding process, I used open coding to familiarise myself with the data. Transcripts were read and re-read while noting down initial ideas or descriptive phrases related to the study's aims. After gaining an in-depth

understanding of the content, I developed a coding framework based on the theoretical interests that guided the research questions, as well as the issues that recurred in the text itself (Saldana, 2013). Initial code categories included topics related to the interview guide, such as descriptions of how mothers feed their infants, what influenced their choice, what challenges they experienced with feeding their infants and what they had been told about different methods of feeding.

I applied the initial categories to organise the data into more manageable segments in Microsoft Word, while simultaneously refining the coding framework into a codebook (Appendix K) that would help code the text more accurately in the next phase of the analysis. After reviewing the coded text segments, I used the codebook to code the text in ATLAS.ti. Creating a codebook helped to establish explicit boundaries to help limit redundant coding (Attride-Stirling, 2001). This two-stepped process led to the elaboration of some codes and elimination of others, resulting in a systematic coding scheme that could capture the different nuances of feeding practices, experiences and beliefs that were described by the study participants. A table of the codes used for the analysis is presented in Appendix L.

3.7.2 Identifying and refining themes. An ATLAS.ti output illustrated the quotations underneath each code individually. I used this output to re-read the collated data to identify and organise themes according to techniques provided by Ryan and Bernard (2003). Each theme was explored in relation to the complete data set to further refine the themes and classify the core themes and subthemes.

3.7.3 Exploring themes and interpreting patterns. Networks were established to organise the different main themes and sub-themes identified in the data. I then explored

the themes and their networks to begin making sense of the patterns that underlie them or that characterise them.

3.7.4 Reporting. Extracts from the transcripts, which are representative of the core themes, were selected to be incorporated in the report of the analysis. The factors that influenced participants' feeding choice and practice identified through the analysis, accompanied by appropriate quotations were then presented within a general systems theory (GST) framework. This allowed for the discussion of the factors that motivate or prevent mothers from adhering to EBF practices in the two study communities.

3.8 Trustworthiness

I used guidelines recommended by Morrow (2005) and Shenton (2004) to maintain the quality and trustworthiness of the research study. Trustworthiness in qualitative research involves research processes that enhance the credibility, dependability, confirmability and transferability of the study (Mays & Pope, 2000; Morrow, 2005; Shenton, 2004).

3.8.1 Credibility. In order to achieve credibility, I included a number of strategies that aim to increase rigour in qualitative investigations. Prior to conducting data collection, I familiarised myself with the literature in order to expand my own understanding of the many ways in which the study phenomenon could be viewed. I stayed in Zithulele for a month to oversee the data collection process, which allowed me to ground the study more effectively in the culture and context of the participants (Morrow, 2005).

The pilot interviews helped to determine whether the proposed questions would be suitable to answer the research questions (Morrow, 2005). It also provided valuable learning opportunities for newly trained interviewers. I was present for the interviews and therefore engaged in numerous formal and informal discussions with the interviewers throughout the

research period. I conducted frequent debriefing sessions to provide a sounding board for the interviewers and to discuss strategies that could be useful for the next interview or focus group discussion. Since the interviews were conducted in a language that I could not understand, the debriefing sessions also helped to provide insight into the interview process instead of waiting for the completed transcription to get a sense of the data.

Throughout the research process, I reflected on my own orientations, values and assumptions and how this could have affected the research. I kept a journal to capture my experiences in an attempt to explore how I, as researcher, made meaning of the research activities. The reflective piece included in section 3.8.5 discloses how my own background and subjective experience of the process impacted on the choice of topic, how I managed the interview process and analysed the data.

Lastly, I used two different methods to collect the data which are both well-established methods for qualitative investigation. Triangulation of the results from individual interviews and focus group discussions were used to compare findings across data collection methods. I analysed data for the total sample (both sites) and differences between the two study sites were explored. According to Shenton (2004), site triangulation helps to determine if results are particular to local factors distinctive of the site, or if similar results occur in different contexts.

3.8.2 Dependability. Dependability is concerned with maintaining stability of data over time and under different conditions (Elo et al., 2014), which is often linked with the credibility of the research (Lincoln & Guba, 2000). Dependability necessitates a detailed account of what was executed and how exactly this was done so that readers can track the research activities and processes consistently through the report (Morrow, 2005). In this study, the process of training data collectors, conducting pilot interviews to refine the

interview guide and the data collection and analysis procedures is described in detail. Interview guides were translated independently by two data collectors and discussed until consensus was reached. As a measure of data quality control, interviews were also transcribed and translated independently by professional transcribers and both versions were compared for inconsistencies. Furthermore, the data collection process was overseen by the same person at both study sites for consistent supervision and quality control.

3.8.3 Confirmability. In order to ensure, as far as possible, that the findings presented in this research are the result of the experiences and ideas of the participants instead of my own, I have included a reflective piece to situate myself more explicitly within the research process. Furthermore, data collectors read through their transcribed interviews to ensure that the original content was retained throughout the translation process.

3.8.4 Transferability. I have described the context of the study area in detail as well as the selection processes for participants and the procedures for data collection and analysis. Reading and studying these processes can guide those who intend to transfer these findings to similar settings.

3.8.5 Reflection on the research process. According to Malterud (2001), a researcher's background, social position and subjectivity influence the choice of topic, the theoretical frameworks chosen, the data selected for analysis and the interpretations resulting from the data. I will conclude this section on trustworthiness with a description of myself and aspects of my background that, to the best of my knowledge, may have impacted the research process.

3.8.5.1 Background and social position. As a white, 27-year old South African female, I grew up in a time when Apartheid was actively implemented at all levels of society, followed by the transition to democracy at government level when I was five years old. I grew up in an affluent, exclusively white suburban area. As a result, I had limited contact and interaction with people from diverse cultures or racial groups. However, throughout my childhood and teenage years, my mother managed various community projects in informal settlements around Stellenbosch and Cape Town. Since my mother was a single parent, I often accompanied her to work after school or on weekends. I believe that this helped to give me some insight into the inequality that existed (and still exists) between my life and that of many other South African women. With my mother's support, I began to volunteer regularly at a care facility for orphans and vulnerable children in Khayelitsha when I was 15 years old. I believe that these experiences fostered a sense of awareness that afforded me the opportunity to see the world differently than most of my peers. Ultimately, these experiences shaped my decision to study psychology and to pursue activities that seek to improve the impact of HIV on child care and development in South African communities.

My background may have influenced many aspects of the research process. In the present study my social position differed markedly from the participants in terms of race, culture, level of education and social class. There are many differences between myself and the women that participated in this study. First, I am not a mother and have limited experience of what child-rearing entails for women in these communities. Second, I am not able to fully speak or understand isiXhosa, and could not interview the participants by myself. Third, I was concerned that my presence at the interview would make participants uncomfortable, given our different cultures and social positions. I questioned how these power differentials might affect participants' willingness to disclose sensitive and emotional

experiences in my presence, and tried to create a comfortable and non-threatening atmosphere. Moreover, it should be noted that I did not have extensive experience in qualitative research and the present research was in many regards a learning process. Despite certain of my characteristics being potentially problematic, it is possible that being an outsider was also an asset, because I was able to ask questions to get clarity on issues regarded as 'normal' or 'usual' by the participants and data collectors.

3.8.5.2 Data collection process. Although I did not conduct the interviews myself, I was present for the interviews that took place at both study sites. This allowed for immediate debriefing with data collectors following the interviews and provided valuable opportunities to discuss strategies for future interviews. Accompanying the data collectors to conduct interviews in participants' homes or to transport participants to the research centre for their interviews was a valuable research experience in itself. I tried as much as possible to develop a nuanced understanding of what and how mothers from these communities feed and care for their infants. I became aware of how little resources the households had at their disposal, observed rows of formula tins displayed on counters, dirty bottles filled from buckets of water, crying infants, mothers complaining about painful breasts and the presence of inquisitive family members. My daily engagement with the subject material resulted in an increased sense of awareness of what people around me were saying about motherhood, infant feeding and HIV.

I travelled to Zithulele and stayed there for a month to oversee the interviews for participants from the area. Having worked in Khayelitsha before, I felt more comfortable there, while Zithulele was a completely new experience for me. During my stay in Zithulele, I became very aware of the conditions of poverty in this rural area and its impact on child care in particular. The interviews in Zithulele were conducted first, and when I returned to

Cape Town to oversee the interviews in Khayelitsha, my understanding of the woman there felt altered as well. Since most of the Khayelitsha participants had migrated from the Eastern Cape to look for work, I was much more aware of where they came from and how this could possibly influence their beliefs and experiences.

3.8.5.3 Data analysis. The process of coding data and identifying themes was a time-consuming and sometimes frustrating experience. As a highly detail-orientated person, I wanted to incorporate almost every piece of text, which initially created some challenges in organising the data into smaller and more manageable segments. The guidance and patience of my supervisor and discussions with peers helped me to approach the analysis in a critical and systematic way. I was also aware of how the theoretical knowledge influenced the theme identification process and tried to remain open to unexpected connections between themes.

3.9 Conclusion

This chapter described my reasoning for using a qualitative research design and provided details of the recruitment of participants, data collection, data analysis and ethical considerations. Lastly, I discussed the strategies that were incorporated to maintain the trustworthiness of the research and provided a reflection piece on my experience of the research process to supplement the discussion.

Chapter 4
Results

4.1 Introduction

This chapter presents key findings from the interviews and focus group discussions that included 85 women from one rural and one peri-urban community in South Africa. Analysis of the data revealed numerous shared attitudes, beliefs and experiences that either motivated or prevented participants from exclusively breastfeeding their infants. The chapter begins with an overview of the study participants' demographic characteristics and feeding practices at the time of the interview to provide a context for the findings. The findings from the analysis have been organised into six central themes. Each theme is defined and divided into relevant subthemes. The discussion of the themes and subthemes is presented with extracts from the interviews and focus group discussions in order to illustrate these findings. Extracts are labelled with codes for reasons of privacy and confidentiality. The codes denote the study site each participant is from, the participant's feeding practice at the time of the interview and self-disclosed HIV status.

4.2 Description of Participants

4.2.1. Demographic information. All participants were females between the ages of 18 and 43 years (mean age = 27). For most participants this was their first or second child, while for a few participants this was their fifth or even seventh child. More than half of the participants (52%) from Zithulele disclosed that they were living with HIV, while 32% of participants from Khayelitsha disclosed that they tested positive for HIV. Demographic information of the mothers who participated in the individual interviews and their infant's age is presented in Table 2.

Table 2

Demographics of participants and their infants

Characteristic	Zithulele (n = 19)	Khayelitsha (n = 34)	Total (n = 53)
Mother's age			
Age range (years)	18 – 43	18 – 43	18 – 43
Mean age (years)	26.8	27.7	27.3
Parity			
Average number of children	2.7	1.9	2.2
HIV status			
Self-disclosed HIV+ (%)	10 (52%)	11 (32%)	21 (40%)
Infant's age			
Mean age (months)	3.2	3.6	3.4

4.2.2 Current feeding practice. At the time of the interview, 21 (40%) participants were practicing mixed feeding, while 16 (30%) participants were exclusively breastfeeding and 16 (30%) were giving their infants no breast milk (replacement feeding). The feeding practices of participants at the time of the interview is presented in Table 3. Feeding practices were defined according to the infant feeding definitions provided by the WHO (2008b), as presented in Table 1. Mixed feeding was the most commonly reported practice, with 40% of participants feeding their infants a combination of breast milk and formula milk and/or complimentary foods at the time of the interview. The same number of participants in the total sample reported that they were exclusively breastfeeding and replacement feeding respectively. Sixteen mothers (30%) of the total sample were exclusively breastfeeding and 16 mothers (30%) were giving their infants formula milk and/or complimentary foods instead of breast milk. Of the participants who were not mixed feeding their infants, exclusive breastfeeding was more common in Zithulele (37%) and replacement feeding more common in Khayelitsha (41%).

Amongst the 21 mothers who disclosed that they were HIV-positive, exclusive feeding (either exclusive breastfeeding or replacement feeding) was the most commonly practiced feeding method. At the time of the interview, nine participants were breastfeeding exclusively and nine participants were giving their infants no breast milk (replacement feeding). Although mixed feeding was the most commonly practiced feeding method, only four of the participants living with HIV reported that they were mixed feeding their infants.

Table 3

Feeding practices according to study site and mother's HIV status

Current feeding practice	Zithulele (n = 19)	Khayelitsha (n = 34)	HIV+ (n = 21)	Total (n = 53)
Exclusively breastfeeding	7 (37%)	9 (26%)	9 (43%)	16 (30%)
Replacement feeding	2 (10%)	14 (41%)	9 (43%)	16 (30%)
Initiated breastfeeding	1 (5%)	10 (29%)	4 (19%)	11 (21%)
Mixed feeding	10 (53%)	11 (32%)	3 (16%)	21 (40%)
Predominant/Partial Breastfeeding	3 (16%)	1 (3%)	1 (5%)	4 (7%)

4.3 Themes

The data from the interviews and focus group discussions were analysed to identify factors that influenced participants' infant feeding practices and experiences. Using the ATLAS.ti. output and thematic analysis techniques, I clustered the findings from the analysis into six themes: 'desire to breastfeed, 'availability of formula milk', 'personal feeding experience', 'pressure to satisfy (the infant, the family), 'feeding reflects on mothering' and 'the social risk of exclusive feeding'. The themes and their subthemes are presented in Table 4.

Table 4

Themes and subthemes

Theme	Subthemes
Desire to breastfeed	Health benefits of breast milk
	Health risks of formula feeding
	Maternal-infant bonding
	Cost-effective feeding
Availability of formula milk	Marketing and distribution of infant formula
	Use of infant formula in health facilities
	Formula milk supplies: Available but not sustainable
Personal feeding experience	Perceived feeding success
	Personal challenges and constraints
The pressure to satisfy (the infant, the family)	Fear of "not enough"
	Following infant cues
	Family's preference and influence
Feeding reflects on mothering	Beliefs about infant weight
	Maternal behaviour
The social risk of exclusive feeding	A culture of mixed feeding
	HIV stigma and risk of disclosure

4.3.1 Theme 1: Desire to breastfeed. This theme refers to a participant's desire at any point before or after her infant's birth to initiate breastfeeding. A desire to breastfeed was closely linked to breastfeeding intention, whether the participant was able to follow through on this intention or not. Even though participants did not necessarily intend to breastfeed exclusively, an initial desire to feed the infant some breast milk (either partially, predominantly or exclusively) was universal amongst study participants. In both communities, breastfeeding dominated as the perceived optimum feeding option for infants younger than six months of age.

The analysis identified several beliefs that encouraged participants to initiate predominant or exclusive breastfeeding, all linked to the perceived benefits that breastfeeding provided in terms of nutrition, protection against illness and as an activity that promotes maternal-infant bonding. Furthermore, the risks that many participants associated with formula feeding and the fact that breast milk is free were prominent motivating factors that encouraged participants to opt for breastfeeding.

4.3.1.1 Health benefits of breast milk. Participants at both study sites assigned value to breastfeeding based on an understanding of the health benefits associated with the qualities of breast milk. The women were unanimous that breast milk is good for infants because it contains vitamins, protects the infant against disease and strengthens the infant's immune system. Participants believed that if they breastfeed, their infants would grow well and would not be prone to illness. A few women thought that breastfeeding makes children intelligent and likeable, commenting that breastfed babies are usually "beautiful", "cute" and "smart". Compared with formula fed infants, participants perceived that breastfed infants are healthier and less prone to illnesses:

> *"When you are breastfeeding you can easily detect when your child is not feeling well and breast milk is good because it builds your baby's immune system unlike the bottle that can be exposed to germs and be infested with flies but breast milk is safe"* (V19_KHA_RF)

These beliefs about the health benefits of breast milk for the infant were largely influenced by contact with the health system. Participants described the information that they received from the clinic or hospital as increasing awareness of the health benefits associated with breastfeeding. The majority of participants were knowledgeable about the recommendation to exclusively breastfeed, and this was most commonly based on

information provided by nurses or doctors. For some participants, the information and advice they received from the health facilities influenced their view of certain feeding practices, especially EBF. Participants who chose EBF, especially HIV-positive participants, frequently referred to the advice they received from the clinic as having had a bearing on their feeding choice:

> *"Before I use to think she was not getting enough but since it was explained to us at the clinic I now understand that the baby can get enough from breast milk as it contains everything and I don't have to give her water as she is growing well"* (V11_KHA_EBF_HIV+)

For some HIV-positive participants, contact with health facilities influenced knowledge about HIV transmission and therefore motivated EBF as their feeding choice:

> *"They told me that chances of infecting my baby are very small since I am taking ARVs and giving the baby the Nevirapine, but it is possible that the baby can be infected and so I am only breastfeeding"* (M05_ZIT_EBF_HIV+)

However, participants also reported instances where they did not follow the advice from health care workers, especially when it conflicted with conventional practice or where a participant experienced practical challenges in adhering to their advice:

> *"They advise us to introduce other solid foods after 6 months so they will scald me and really the baby does not get enough from breast milk only… yes they* (nurses) *don't practise what they preach they are just fooling us and I was scared when I had to take my baby for test because I was mix feeding but when the results came back negative I realised that there was nothing wrong about mix feeding"* (V14_KHA_RF_HIV+)

4.3.1.2 Health risks of formula feeding. Participants in the study stated that they were well informed about the health benefits of breastfeeding. For some, however, the 'breast is best' message was so powerful that they perceived formula feeding as second-best or even detrimental to the health of the infant, with the potential to cause illness or death. The health risks associated with formula feeding encouraged adherence to EBF, especially for participants who perceived that illness in other mothers' children could be attributed to formula feeding:

> *"I had a home girl who was working, she had a child and her baby didn't like the formula milk, she changed her baby from one formula milk to the other and the last formula milk that the baby liked caused chest problems that led to the baby's death"* (M17_ZIT_EBF_HIV+)

In some cases, participants' own experiences with formula feeding and infant illness also encouraged adherence to EBF. For a participant from Zithulele who previously had an infant that had died, fear of experiencing illness or death with her youngest infant was a strong motivating factor to avoid any formula feeding:

> *"I once tried the formula milk with my previous child and that resulted in me losing the child"* (M05_ZIT_EBF_HIV+)

The risk associated with formula feeding was largely attributed to the way that it is prepared, as participants considered their living environment to contribute to the risk:

> *"...I could see the difference between the breastfed and bottle fed baby, and the bottle gets exposed to germs where the breasts are safe from germs...we are living in very filthy conditions and people chose to breastfeed because it is safer"* (N13_KHA_RF)

4.3.1.3 Maternal-infant bonding. Breastfeeding was also considered to be an important part of establishing a bond or connection between a mother and her infant. This belief was prominent in both communities. The majority of participants regarded breastfeeding as an important way to show love to the infant or as a means of affection exchange. Breastfeeding helped with bonding because of "eye contact", "communication" and the time spent together between a mother and her infant. For many participants, it was this bond that allowed the infant to distinguish the mother from other people:

> *"I wanted to breastfeed because I wanted to bond with my child so that he can get to know me and grow well as a healthy child…we get to know each other and my child can recognise me by my voice as there is connection between us and he can recognise a stranger."* (V09_KHA_EBF)

Participants also believed that breastfeeding allowed them to notice when a child is ill or about to fall ill, because the infant would refuse to latch to the breast or refuse to drink any breast milk:

> *"When a child is sick you can easily detect that like when the body temperature is high you can feel it as you hold your baby against your body, the baby will not want breast milk when you are breastfeeding and that will be a sign that the baby is sick"* (M0*_FGD1_ZIT)

The experience of bonding and detecting illness through the breastfeeding process was a belief that motivated mothers to choose breastfeeding. This occurred especially where participants made comparisons between breastfed and formula fed infants, as they believed that bonding or detecting illnesses did not take place to the same extent as when infants receive formula milk only.

4.3.1.4 Cost-effective feeding. The fact that breast milk is free and does not need to be purchased motivated participants to breastfeed their infants. Relying exclusively or predominantly on breast milk meant that participants did not have to struggle to buy formula milk each month. Participants often chose to breastfeed because they could not afford to provide the infant with regular formula feeds, nor could they rely on their family to provide it for them:

> *"...I remember the other day I was breastfeeding and when I stopped the child started crying and an elderly mother advised me to feed formula milk suggesting that maybe my child was also not getting enough but I told her that I am prepared to sit there for 3 hours breastfeeding my baby because I can't afford formula milk even for a month"* (M17_ZIT_EBF)

An emphasis on the economic benefit of feeding breast milk as opposed to purchasing infant formula every month was prominent in Khayelitsha and nearly universal in Zithulele. Every participant who exclusively breastfed their infants mentioned cost-effectiveness as a significant benefit that motivated them to continue. However, the economic benefit of using breast milk also contributed to the practice of mixed feeding in many cases. For participants who give formula milk and/or complimentary foods to their infants, breastfeeding provided some relief from buying formula milk and other foods. Supplementing formula milk with breast milk meant that participants did not have to spend as much money on these products as they would if they were replacement feeding:

> *"It saves me a lot of money from buying formula milk, because you don't have to buy formula at all if you breastfeed exclusively but if you breastfeed and buy the formula milk you don't have to buy that much"* (M12_ZIT_MF)

Other participants who normally formula feed would resort to breastfeeding, usually towards the end of the month, when their formula or food supplies have been depleted and they were unable to afford more:

> *"We buy enough formula milk to last just before my partner gets paid but when it's finished maybe a day or two before we get money to buy another formula milk I breastfeed until I get money"* (N04_KHA_MF)

The benefits of breastfeeding as a cost-effective feeding option that simultaneously promotes maternal-infant bonding and protects the infant against illness encouraged the practice of exclusive breastfeeding, especially in Zithulele. However, the dominant discourse of "breast is best" to some extent influenced mothers who formula fed as well. These same benefits mentioned by mothers who breastfeed exclusively also encouraged mothers who formula feed to continue breastfeeding, resulting in heightened rates of mixed feeding in the study communities.

Even though participants strongly believed in the value of "breastfeeding exclusively" or "breast milk only" for infants, only 16 participants were able to translate this belief into practice and sustain it. Breastfeeding intention alone was in many cases not enough for participants to continue with this method of feeding. A recurrent view in the interviews was that choosing replacement feeding or the discontinuation of breastfeeding (and in many cases exclusive breastfeeding) was against the participants' desires. Almost all infants at some point received breast milk, with the exception of one infant from Zithulele and four infants from Khayelitsha who had reportedly never been breastfed. For participants who never initiated breastfeeding, an HIV-positive status was the given reason from all but one participant. Several mothers reported weaning their infants or using supplemental

formula because of medical complications, breastfeeding difficulties or personal and practical constraints:

> *"I would have loved to breastfeed because I can see children who are breastfed are healthy and also you don't buy formula milk at least for 6 months when you are struggling financially…it was so frustrating because I wanted to just breastfeed for six months but there was nothing I could do and since I did not have money to buy formula I really felt bad."* (M06_ZIT_MF)

Participants in this study shared common beliefs that breastfeeding was beneficial for infants; nevertheless, many also believed that early introduction of formula and solid foods were unavoidable in certain circumstances.

4.3.2 Theme 2: Availability of formula milk. This theme considers the influence that the promotion of formula milk and its availability in the communities had on infant feeding practices. Firstly, formula milk products are widely marketed and distributed in Khayelitsha and Zithulele. Secondly, participants were aware that infant formula is available at health facilities under certain conditions, especially when mothers experience problems with breastfeeding.

4.3.2.1 Marketing and distribution of infant formula. Formula milk products were readily available at most local supermarkets and *spaza* shops (informal convenience stores) in Khayelitsha and Zithulele. Many participants described being part of a community where formula feeding young infants has become normal and accepted behaviour:

> *"...when I sometimes visit where there is a baby I can see even if the mother is breastfeeding but there is always formula milk in almost every household"* (M11_ZIT_MF)

> *"Mothers feel pressured to feed formula as everybody else is feeding formula but when we grew up we were fed Inembe which is a fine maize porridge and when you feed your child that nowadays you become a laughing stock"* (V05_KHA_RF)

Participants in both communities were aware of the potential health risks associated with formula feeding. However, participants also believed that formula milk products can be trusted as a legitimate substitute to breast milk, due to its availability in the shops and its use in health facilities:

> *"I think that is because most people believe that if a child dies that means that child was going to die anyway, if formula milk caused problems it would not be sold on the shelves"* (M17_ZIT_EBF).

> *"For example now there are formula milks that matches breast milk like Pelagon, Infacare and Milac, they are exactly like breast milk and are nutritious like breast milk and if your baby is malnourished the nurses usually give you one of those formula milk"* (M02_FGD3_KHA)

4.3.2.2 Use of infant formula in health facilities. Participants from Khayelitsha stated that infant formula was available at clinics and hospitals to mothers who are HIV-positive or to mothers who have difficulties with breastfeeding. In Khayelitsha, HIV-positive mothers frequently made use of the formula provided by health facilities. Of the seven participants in Khayelitsha who opted for replacement feeding, five were receiving formula from the clinic every month. One of the HIV-positive participants who decided not to accept formula from the clinic did so because she believed that her family would become concerned if she uses "free" formula, as it is associated with an HIV-positive status. In Khayelitsha, having the option to receive formula from the clinic seemed to undermine breastfeeding for some HIV-positive mothers, as illustrated by this quotation from a participant who receives formula from the clinic every month:

> *"My concern was not to infect my unborn baby through breast milk and the nurses told me the choice lies with me on how to feed my baby because I could encounter problems when I breastfeed which could leave me with no option but to stop breastfeeding"* (N15_KHA_RF_HIV+)

In Zithulele, the use of infant formula in health facilities was rarely mentioned, where five out of the seven HIV-positive participants were exclusively breastfeeding at the time of the interview, compared to two participants who chose replacement feeding.

In Khayelitsha, some mothers reportedly sell the formula milk they receive from the clinic directly to other mothers in the community, or they sell it to local shops where it is wrapped in newspaper and sold at a significantly reduced price.

> *"There is a lady who also sold me formula milk for R20 and that formula milk had the Philani name tag on it. We buy it from young mothers and no matter how much money you have they will sell you because they are desperate for money"* (M04_FGD3_KHA)

> *"It is not right at all and we are told that we will not be supplied free formula milk any more at the clinic because another lady approached me with a far less price of R15 and I asked her where did she get that formula milk and she told me at the clinic and when I ask her what will she feed the baby she just didn't seem to mind about that"* (V14_KHA_RF_HIV+)

4.3.2.3 Formula milk supplies: Available but not sustainable. With infant formula readily available in the shops, these products can be accessed without difficulty, providing mothers can afford it:

> *"It is easy if you have money because it is always available in the shops"* (M18_ZIT_EBF)

Study participants frequently experienced challenges, especially towards the end of the month, in terms of purchasing formula milk for their infants. Participants borrow money from family members or neighbours, buy formula on credit at the local shops or resort to "loan sharks" in order to afford infant formula. This often creates interpersonal stress and results in arguments between family members or partners:

> *"It is not easy because if I don't have money I don't get the baby's formula and also my mother sometimes has to borrow money from other people, so I feel helpless because I cannot borrow money from other people because I can't repay it but at the shops the formula milk is available"* (M19_ZIT_RF_HIV+)

The high costs of formula milk force mothers to introduce other foods earlier than expected, dilute the formula, or interrupt provision depending on finances. Participants often ran out of formula towards the end of the month, which contributed to the practice of mixed feeding. These challenges were especially pronounced for participants who made use of replacement feeding. For these participants, an inconsistent supply of formula milk often resulted in risky feeding behaviours. In an attempt to reduce costs or make a tin of formula last longer, participants would mix formula with other baby foods (especially Nestum instant porridge) or add a browned flour mixture to the formula milk in an attempt to satisfy the infant's hunger:

> *"I am struggling to buy baby food that can last a month so I mixed formula milk with flour but I hope I will get money to buy formula"* (M06_ZIT_MF)

> *"When the formula milk is finished I prepare porridge by using flour because when you add Nestum to formula milk it get finished soon"* (N01_KHA_RF)

4.3.3 Theme 3: Personal feeding experience. This theme refers to the mother's personal experience of the infant feeding process and how this may determine breastfeeding continuance or cessation. Second, this theme considers to what extent the experience of feeding an infant affects maternal lifestyle and how infant feeding implicates the mother on a personal level. Feeding experiences differed among participants in that mothers ultimately deal with failures and successes differently and perceive different aspects of the feeding process as either rewarding or inconvenient.

4.3.3.1 Perceived feeding success. Positive experiences encouraged participants to continue with their chosen feeding practice. Participants who had a positive breastfeeding experience with their older children or who saw that breastfeeding was working for their infant were more likely to continue doing so, while a negative experience with formula feeding or mixed feeding often influenced a mother to choose EBF with her youngest infant. This choice was usually related to the health of the infant, especially where mothers reported increased experiences of infant illness when they previously used formula milk compared with EBF:

> *"There is a huge difference on their health because this child unlike the previous one who was sickly most of the time because of diarrhoea and I have never been to the clinic with this one because of ill health"* (M18_ZIT_EBF)

Successful EBF made it less likely that mothers would introduce formula or complimentary foods. Mothers who did not experience difficulties with breastfeeding and who experienced that their infants were growing well were motivated to adhere to their initial choice of exclusive breastfeeding. Participants who were exclusively breastfeeding frequently reported that they were satisfied with their infant's health and weight, and that this encouraged them to continue:

> *"Yes I do because I do breastfeed my child and I don't see anything wrong, the baby does not get sick easily and whenever the child is about to fall sick I can see the symptoms…you immediately pick that up when you are breastfeeding"* (M10_ZIT_EBF_HIV+)

Similarly, mothers who did not observe any health-related issues after formula or mixed feeding were motivated to continue giving formula or other foods:

> *"I don't see anything wrong on how I feed my child because my child is growing well and I don't see any difference my baby compared to theirs"* (V05_KHA_RF)

> *"…I was scared when I had to take my baby for test because I was mix feeding but when the results came back negative I realised that there was nothing wrong about mix feeding"* (V14_KHA_RF_HIV+)

A common occurrence amongst the participants was a sense of powerlessness with respect to their ability to continue to breastfeed exclusively. Common fears amongst participants was that they were not producing enough milk, that their infants were not getting enough of breast milk, or that their infants were not growing fast enough:

> *"I mean that the baby does not get enough after putting him on both breasts and still cried and to me that was the sign that I was not making enough breast milk and my breasts are always not full"* (M04_FGD2_KHA)

These issues were evident in many of the women's infant feeding narratives, which frequently indicated that mothers lacked support for infant feeding, leading to feeling unsure, frustrated or dependent on others.

4.3.3.2 Personal challenges and constraints. During the interviews and focus groups, participants frequently discussed what impact breastfeeding or formula feeding had on maternal lifestyle, especially to what extent the feeding practice was convenient or

inconvenient to them. Many participants viewed breastfeeding as convenient, because it involves less effort than formula feeding. These mothers continued breastfeeding, because breast milk is "ever ready", "warm" and "always available" compared to the effort associated with preparing and washing a bottle. Participants believed breastfeeding to be convenient because it is hygienic and involves less effort if they have to feed the infant at night:

> *"Because it saves me time from washing the baby's bottle and the baby can be so impatient and start crying for food while you still have to boil water first but breast milk is ready for consumption"* (V04_KHA_EBF)

The idea of predominant or exclusive breastfeeding was also associated with reduced anxiety as it provided relief from the burden of buying formula milk every month. A few mothers found breastfeeding valuable because it made them less dependent on their families or the father of the child for support, especially where there were limited household resources or where mothers reported relational problems. However, the experience of breastfeeding was not in all cases personally rewarding; a few mothers reported that they did not like breastfeeding, mainly because it hurt, because it was boring, associated with losing weight or because it disturbed the mother's sleep. Breastfeeding also elicited concern for participants who considered breastfeeding exclusively, because they felt that the infant would not get enough of breast milk alone:

> *"I just thought when the baby is not getting enough from breast milk what would I do because the baby would cry and we are advised against mixing formula milk and breast milk"* (V14_KHA_RF_HIV+)

What limited the convenience factor of breastfeeding was when the infant cried at night or needed to be fed at night. Participants also reported that the recommended period

of six months for EBF was too long. Mothers who used formula experienced that formula feeding or mixed feeding was less demanding on maternal lifestyle than breastfeeding, because other people could care for the infant, allowing them to get on with other tasks. They preferred formula feeding because it gave them more flexibility in terms of feeding variety and in sharing child care responsibilities with family or neighbours:

> *"The problem is wherever you go you have to take your child with you…they argued that when you breastfeed that child becomes attached to you and you will not be able to leave the child in the care of someone else even if you as a mother you want to do house chores but the child needs your attention all the time"* (M13_ZIT_EBF_HIV+)

Other mothers were not hindered by these obstacles, as illustrated by the following quotations, where mothers take their infants anywhere and do not mind breastfeeding in public:

> *"I don't care even if I am at Woolworths I just look around for a chair where I can sit down and breastfeed my child…what is important to me is to breastfeed my child, I am not ashamed about breastfeeding"* (V06_KHA_EBF_HIV+)

> *"They want to be free to go whenever one feels like and they are embarrassed to have full breast that are leaking milk. But when you breastfeed you get concerned when you leave your child and even before you leave you first breastfeed and make sure that your child is full…but if you are going to be long you need to take your child along with you…I really don't have a problem with that I can breastfeed anywhere I am not ashamed to do so. I don't mind the people and cannot starve my baby"* (V09_KHA_EBF)

A widely-held belief in both communities was that EBF was not possible for mothers who work, mothers who are looking for work or mothers who are returning to school. Introducing formula milk, soft foods and/or other liquids allow mothers to resume economic

activities without a prolonged break. Women who were working or looking for work frequently reported this concern:

> *"I did breastfeed when I was still at hospital but when I was at home I realised that my baby does not want breast milk even when I expressed milk so I decided to stop breastfeeding and when I thought that I will have to go back to work and I won't have time to breastfeed"* (V02_KHA_RF)

4.3.4 Theme 4: Pressure to satisfy (the infant, the family). The findings in this theme are organised according to two different sources of pressure that mothers described that they experienced. Both sources of pressure resulted in sub-optimal breastfeeding and other risky feeding practices. As much as participants showed awareness of optimal infant feeding, these pressures often outweighed the importance of following these recommendations. First, participants feared that their infants cannot be satisfied with breast milk only, and that they felt compelled to add formula milk or other foods to the infant's diet as a way to reassure that their infants do not go hungry. Infants who were fussy, cried inconsolably after breastfeeding or woke up frequently during the night influenced mothers to introduce formula feeds or other foods. Second, participants frequently experienced pressure from family members to feed their infants in a specific way. Family members were seen as key role-players in the infant feeding practices, and mostly tried to persuade mothers to make use of mixed feeding or give up EBF. Pressure and input from these networks of support influenced the forms and quality of feeding practices.

4.3.4.1 Fear of "not enough". Participants expressed fear for their children experiencing hunger, based on the perception that infants were not satisfied with breast milk or formula milk alone. Most participants from both communities who gave infant formula or complimentary foods did so because they were under the impression that breast milk

alone is not enough to satisfy their infants. A pervasive belief was that infants cannot be satisfied by breast milk alone and that they need formula milk or other foods to satisfy hunger and to help the infant grow properly. In many cases, this perception outweighed the advice received from health care workers to practice exclusive breastfeeding. It was the most commonly reported reason for introducing formula milk or complimentary foods in both communities:

> *"I think breastfeeding exclusively for 6 months is the best way to feed your child but nowadays children don't get enough from breast milk we resort to formula milk like myself I also feed him formula milk but I understand that I am supposed to breastfeed until he is 6 months old"* (V13_KHA_MF)

> *"In our culture we believe that the child needs more than breast milk to have a full tummy"* (M01_ZIT_MF)

Having a satisfied and "full" child was highly valued by participants. Concerns that a child was not "getting enough" frequently preceded the introduction of supplementary liquids or food to the infant's diet. Mothers who exclusively breastfed their infants would introduce formula milk if they believed that their infant's hunger was not satisfied with only breast milk. Mothers who were already giving formula milk to their infants would typically supplement formula feeds with baby foods such as porridge or mashed vegetables if they believed the infant was still not getting enough. The following quotations illustrate how additional foods are gradually introduced and quantities continue to increase as a mother's concern for having a "full" infant persists:

> *"I thought I would breastfeed and then I decided to give formula when I realised that the baby was not getting enough"* (M20_ZIT_MF_HIV+)

> *"I think the child gets enough now because after feeding he does not cry anymore like he used to before I decided to mix Nestum with formula milk"* (M08_ZIT_RF_HIV+).

Despite the recommendation from health facilities that infants should only be introduced to solid foods after six months, many infants were started on solid foods early. While concerns about not feeding the infant enough were common, there were few concerns about feeding an infant more than necessary. In some cases, the need to satisfy the infant's perceived hunger through supplementary feeds was so strong that it caused mothers to overfeed their infants, even if they were aware that it conflicted with recommended dietary intake. For a participant from Khayelitsha, the concern that her child was not getting enough from breast milk was so prominent that she continued to feed her infant Infacare (a specific brand of formula milk) and other baby foods such as Purity to the point of vomiting:

> *"I am doing something that I am aware is not right for my child because his system is not ready to digest food and when I started feeding him Infacare he would puke and when I asked the nurse at the clinic why would a baby puke she told me that happens when the baby's stomach is too full so I feel I am over feeding my child"* (V10_KHA_MF).

4.3.4.2 Following infant cues. Despite their beliefs that breastfeeding was healthier, many participants reported giving formula milk or soft foods because they believed that their infants' behaviour could be modified by feeding. Participants reported that the infant's behaviour had guided their infant-feeding decisions, even if the practices were not perceived by the mother to be the healthiest option for the infant. Participants recognized many hunger and satiety cues. Infant crying was the most common cue used by mothers to initiate other feeds or change feeding behaviours. During a focus group discussion in Zithulele, all four group members referenced infant crying as a factor that resulted in mixed feeding:

"I was breastfeeding for about a month but my child would cry and to me that showed me that my child was not getting enough so I decided to introduce formula milk and that is when the baby stopped crying" (M02_FGD2_ZIT)

"I had a similar problem with this mother my child also would cry so that is why I decided to give formula milk" (M04_FGD2_ZIT)

"It will seem like a chorus because it was for the same reason" (M01_FGD2_ZIT)

Participants from both communities reported that their infants would cry inconsolably and that breastfeeding often did not help to stop the infant's crying. This was an indication that the infant was still hungry or in need of further feeding:

"As I am breastfeeding, my child likes to cry a lot and does not get enough from the breast milk so ever since I started feeding formula milk he does not cry anymore after feeding him" (M20_ZIT_MF_HIV+).

Participants experienced that if they gave their infants additional formula milk or food, the infants would stop crying. This was perceived as a positive effect and provided justification for using formula milk:

"My child cries if she has not had enough or is not yet full and should I do everything that I think she is crying for and still not stop crying then I can tell that the baby needs more and especially if there's no more milk coming out of my breast as I don't produce enough I then prepare the Lactogen and feed my child" (M12_ZIT_MF)

Mothers also stated that feeding formula milk and complimentary foods help infants to fall asleep more easily and enable infants to sleep for longer hours:

"The minute you remove your child from the breast the baby starts crying but when you feed the bottle the baby falls asleep" (M0*_FGD2_ZIT)

> *"The difference is that when I introduced formula milk is that my baby sleeps for long hours without interruptions. I can also sleep well at night knowing that I don't have* [to] *wake to feed the baby in the middle of the night"* (M03_FGD4_KHA)

4.3.4.3 Family preference and influence. Even though most women in the study were educated about high risk behaviours, many participants experienced significant pressure from family members, especially from the infant's paternal or maternal grandmother to introduce other fluids, soft foods or medicine to their infants' diets. Some participants found themselves in a difficult position where they had to make a decision based on contradictory messages from health care workers and family members. Mothers experienced difficulties in refusing the family's advice and regarded education for their families as an important strategy that could help to counteract these pressures:

> *"...we are getting a lot of pressure from our families to feed our babies other foods before the baby is 6 months, to also give wind medicine to the baby so their advice is the opposite of what the nurses advise us at the clinic, so if we have such information delivered at home it will make it a lot easier for our families to understand why someone has to breastfeed or formula feed exclusively for 6 months without giving anything else to the baby. Even if it, this can be done through radio or television because elders will ask you what do you know about raising a baby?"* (N14_KHA_MF)

One HIV-positive mother who was struggling with her infant's health asked for support from the clinic to counteract the pressures from her family who were persistent about giving the infant traditional medicine:

> *"...I had to ask a nurse at the clinic to write me a letter instructing them not to give the baby any liquid and I took that letter home to my parents and for that reason they understand because the nurse said that in the letter"* (N08_KHA_RF_HIV+)

Participants stated that their family members also frequently communicated concerns over the insufficiency of the infant's diet. Grandmothers and other family members (aunts or siblings) generally encouraged breastfeeding, but the practice of exclusive breastfeeding often elicited comments about starving the baby or concerns that breast milk is not enough. Family members, particularly the infant's grandmother, placed significant pressure on participants to introduce formula milk or complimentary foods to the infant's diet:

> *"I feel there is a lot pressure on us as the very same family that pressurise you into buying formula milk does not help to buy it when you run out of it. They are just quick to comment and suggest that you are starving the baby and you should add formula milk but they won't be there to help you buy the formula when you struggle you will be on your own"* (M0*_FGD1_ZIT)

In Khayelitsha and commonly in Zithulele, grandmothers had a significant influence on the early introduction of complementary foods, especially infant cereal and other soft foods. This practice was encouraged by grandmothers, supported by the belief that the infant was not getting enough from breast milk or formula milk alone.

> *"She always checks on how her grandchild is doing and how many times I feed the baby and feels that I am starving the child…I chose to feed my baby formula milk and instant porridge because my mother felt the baby was not getting enough from formula only"* (N13_KHA_RF)

Few women reported that their families were supportive towards the practice of EBF. However, as illustrated in the extract below, approval and support from family members may help to counteract negative judgements from the wider community and motivate mothers to continue breastfeeding exclusively:

> *"My family encouraged me and support me to breastfeed from birth and people in the community advise me to stop breastfeeding now or after 6 months they believe that when breastfeed your child will give me a problem if I don't stop breastfeeding now…I don't feel it is a good advice and don't take such advice because I am with fine how I feed my child now as I believe if I could stop breastfeeding it will affect his weight"* (V09_KHA_EBF)

4.3.5 Theme 5: Feeding reflects on mothering. Infant feeding signified much more than the purely nutritional and physical aspects involved in feeding a baby. This theme considers perceptions of exemplary or inadequate mothering, and how these beliefs relate to the way that participants fed their infants. There were two prominent concerns that reflected on the mother's ability to adequately care for her infant. First, infant weight was extremely important to participants in both communities. Second, maternal behaviour was strongly tied to infant growth and weight gain (or lack thereof). Simply put, if an infant was "large" or "heavy", the mother of the infant was perceived by others as a good mother who was able to adequately care for her child. If an infant was "small" or "underweight" it was believed that the mother does not look after her child well, or that she engages in behaviour that causes harm to the infant, which results in illness or infant weight loss. These beliefs were prominent in both communities, confirmed by the focus group discussions.

4.3.5.1 Beliefs about infant weight. The initial interviews indicated that participants' discussions about infant feeding often shifted naturally to discussions about infant weight. The weight or size of the infant was very important to most participants, as a "small" baby was believed to be "infected", "sick", or "malnourished". An infant who is "big" or perhaps even "fat", was seen as full and satisfied, and perceived by mothers (and others in the community) as healthy:

"They get concerned and ask what do you feed your baby if he is small and if he is big they believe that he is healthy and well nourished" (N10_KHA_MF)

These ideas about infant weight were closely linked to how the infant was perceived or treated by other people. Participants believed that if an infant is small or underweight, other people would not show any interest in the infant:

"People are attracted to a big cute baby even if he is ugly they easily pick up that baby unlike the one who is small in size who looks like a sick baby" (N07_KHA_MF)

Mothers seemed keenly aware of what other people think and say about their infants. Participants believed that the weight of the infant reflects on the abilities of the mother to raise her infant:

"It is very important, I wouldn't lie - to see my baby's weight dropping down from what it is, I wish I can maintain my baby's weight or rather go up otherwise I will look like I am not fit to be a mother" (N04_KHA_MF)

"I get complements from people that I look after my baby very well and she is eating well and their grandmother feels the same…they advised me to raise and feed my child in a good way because if you don't take care and look after your child it will reflect on the child, the child will be underweight and not look appealing to other people" (V07_KHA_RF_HIV+)

These beliefs created anxiety and concern about weight loss and as a result, infant weight was closely monitored:

"There is so much that people believe when your child has a small weight, I know of another who is in the same street as me who always goes around gossiping about my child's weight, and we happened to be at clinic on the same day and she just

couldn't help herself but wait and watch the scale just to see what my baby weighs" (N05_KHA_MF)

It also meant that if some mothers felt that their infants were not picking up weight, they introduced formula or other soft foods to the infant's diet with the hope of accelerating infant weight gain. Many participants believed that introducing formula or soft foods alongside breast milk would enable a child to grow faster:

"I was advised at the clinic to not feed anything but my mother advised me against that, so my mother feeds her yoghurt and Purity and when I take [her] *to the clinic they ask me what do I feed her and I tell the nurses that I am bottle feeding but I am feeding her other foods... I noticed that my baby is gaining weight, so I strongly agree with her* (participant's mother) *... it is important and I get worried when my child lose weight as she also lose appetite and I become scared of what the people will think"* (V15_KHA_RF_HIV+)

Infant weight gain and growth also determined whether participants adhered to, or changed from, their initial feeding practice. Mothers used the infant's weight as a way to measure if their feeding practice was working or not, or if they needed to try something different:

"I think formula milk is good for babies otherwise when your child does not get it he will lack something in his body and if you don't breastfeed your baby will be malnourished. And ever since I introduced formula milk my baby picked up weight and I get compliments from people about my baby's weight" (V13_KHA_MF)

Participants were encouraged to continue with their chosen feeding practice if they believed that their infant was growing or gaining weight as a result of the feeding method:

"Most people comment about her weight and tell me that she looks like she a 6 months old baby and think that I feed her porridge but I tell them that I only

breastfeed…such comments make me smile because I am mother for the first time I think I am feeding her and looking after her very well and her weight shows that she is healthy. So I become worried when a mother is told by nurses that her baby has lost weight" (V16_KHA_EBF)

4.3.5.2 Maternal behaviour. The power of breastfeeding as a culturally-anchored practice and as a moral commitment on the part of the mother was a clear theme. Mothers who do not breastfeed described feeling judged by their communities. Participants believe that the method of feeding indicates to others the mother's sense of dedication towards her infant:

"This is how I show love to my baby… you cannot leave your child behind visiting your friends and you don't even bother to rush back home because you know that you are not breastfeeding" (M17_ZIT_EBF_HIV-)

"They tell me that I am lazy and I want to gallivant that is why I am not breastfeeding but that was not my intention. I was frustrated because I was concerned if I will manage the expensive formula milk" (N05_KHA_MF)

Certain maternal behaviours were believed to affect the infant in a negative way, especially if the mother was breastfeeding. Sexual activity of a breastfeeding mother is traditionally deemed harmful to the infant:

"My child is still young so I can only have sex when she is 7 months, I think I won't breastfeed her clean milk should I be sexually active now" (V04_KHA_EBF)

Almost all the participants from Zithulele and Khayelitsha (with the exception of one mother in Zithulele and two mothers in Khayelitsha) believed that mothers with young babies should not be having sex, as it would affect the infant in a negative way. It was believed that sex compromises the infant's health through "dirty" breast milk, causing

diarrhoea, weight-loss or developmental problems. Another pervasive belief was that infants of sexually active mothers would be unattractive or disliked by other people, and that such an infant could be identified through them being under-weight:

> *"They believe that your child will be affected and the baby will lose weight and not appeal to other people. The baby's skin will look wrinkled…I wouldn't say I agree or disagree but when someone comments about a baby who has symptoms you will also be convinced that maybe the reason is her mother who is having sex"* (M01_FGD2_KHA)

Participants were aware of a common belief in their communities that it is not right or good to breastfeed if a mother is HIV-positive. Mothers who are HIV-positive and breastfeed receive negative judgments from others, specifically because they believe it puts the infant at risk of infection:

> *"When you are diagnosed with HIV after birth you should not breastfeed at all"* (M01*_FGD1_ZIT)

> *"People gossip and say a lot about HIV positive breastfeeding mothers, I wish people can stop gossiping about other people and advise you on the best options as an HIV positive mother"* (V18_KHA_RF).

4.3.6 Theme 6: The social risk of exclusive feeding. In a context where child care responsibilities are typically shared by multiple caregivers, mothers experienced real difficulties in going against the advice or beliefs of others involved in the infant feeding process. This theme is concerned with the difficulties involved for mothers who attempt to practice exclusive feeding (either exclusive breastfeeding or exclusive formula feeding) in a culture where mixed feeding is the norm and where involvement of other caregivers in infant decision-making and feeding are high:

> *"I was inexperienced and you get a lot of advice on how to raise your baby, some will advise to give your baby wind medicine which is something we are advised against at the clinic, also we are advised not to feed our babies anything except breast milk… we believe that you should feed your baby the instant porridge even though the instruction on the porridge is written that you should feed your baby that porridge from 6 months. In the rural areas mothers even feed their babies mashed potatoes. So I informed the elders at home and they did not agree and they told me that the nurses are feeding their babies* (other foods) *before 6 months"* (N14_KHA_MF)

4.3.6.1 A culture of mixed feeding. In both study communities, mixed feeding was perceived by mothers as the cultural norm for infant nutrition. Many women believed that exclusive breastfeeding was not feasible because others were involved in the care of the infant who would then find taking care of the infant difficult if the mother was only breastfeeding. Formula feeding allowed other people to feed the infant when the mother was away. This was not just beneficial to the mother; other people wanted to share in the care of the infant, particularly feeding, and pressurized the mother into letting them do so. Breastfeeding exclusively complicated separation between participants and their infants, which often motivated the use of formula feeding and complimentary feeding:

> *"Sometimes your family members will tell you that they can't look after your child because you are only breastfeeding and so you cannot leave your child behind and wherever you go you have to take your child with you and your child is not used to other people, and so they advise you to buy formula milk so that they can feed your baby formula milk while you are away"* (M0*_FGD1_ZIT)

> *"They also feel that I am doing the right thing because there will be times when I have to leave my child in someone's care so it will be difficult to look after my child if I am breastfeeding only"* (N05_KHA_MF).

Women who were employed or searching for employment frequently reported this concern, as did mothers who intended to return to school. They preferred formula feeding because it gave them more flexibility to return to work or school and therefore leave the infant in the care of someone else:

> *"A breastfed child is a problematic one as you cannot leave your baby with anyone else and when you get a job you cannot accept that job as your baby is only used to breast milk"* (N12_KHA_RF)

Pressure and negative comments from family members and friends influenced feeding practices for mothers who chose exclusive feeding. Even though breastfeeding is culturally important, breastfeeding exclusively elicited negative judgements from others in the community:

> *"People believe that you are starving your baby and maybe think that you don't want to buy food for your baby"* (N16_KHA_EBF_HIV+)

> *"Some tell me that I will never be able to go anywhere because I am breastfeeding, elder mothers who like to ask people to do things for them use to tell me that they can't ask me because I am always breastfeeding. Some say that the reason why I left school is because I was lazy to go to school and I am using breastfeeding as a scape goat"* (M17_ZIT_EBF)

Mixed feeding was tempting for HIV-positive participants, although the majority of mothers were aware of the importance of adhering to one method of feeding and the increased risks of transmission associated with mixed feeding. HIV-positive mothers experienced increased difficulty in terms of leaving their infants in the care of other people. Providing instructions on what the infant may and may not eat raises questions about why the infant may not receive other foods. Participants were also concerned about leaving their

children in the care of someone else, in case they decided to feed the infant something else while the mother is away. Needing to leave the infant in the care of someone else also brought up concerns about disclosure:

> *"There is no way you can keep that information because if you leave your baby with someone as we live among people, and give instructions as to how she should feed your baby they get concerned and suspicious and sometimes ask other people why your baby cannot be fed other foods"* (M01_FGD1_KHA)

4.3.6.2 HIV stigma and risk of disclosure. Fear of stigma often prevented HIV-positive mothers from feeding their infants in accordance with recommendations from health facilities, because of the social implications associated with exclusive feeding (either exclusive breastfeeding or exclusive formula feeding). In both settings, the choice of exclusive feeding posed a threat of being exposed as HIV-positive. Participants from both sites acknowledged that there was a belief in the community that if a mother does not breastfeed, people will assume that she is HIV-positive.

> *"...people will come and visit you as if they want to see your baby but are so curious to find out whether you are breastfeeding or not... it is very depressing because when someone visits you are not sure whether it is an honest visit or there is a motive behind the visits as they sometimes come very early in the morning and maybe see HIV medication you become worried as she now knows about your HIV status and also knowing that the whole community will be aware of your status"* (M01_FGD1_KHA)

Exclusive formula feeding was also stigmatizing because the community knew that HIV-positive women received free formula from the health facilities. Collecting formula from the health facilities or giving only formula milk resulted in suspicion of HIV:

> *"They assume that you are HIV-positive which is not always the case because I also got formula milk at the clinic because I had a lump in my breast…but when I got back home in my community they believed that I am HIV-positive and even posted that on Facebook"* (M01_FGD3_KHA)

As a result, some mothers in Khayelitsha chose to hide the formula milk they receive from the clinic or empty it out into another container to avoid suspicion.

> *"People talk and some can visit you just to see whether you are breastfeeding and one can see from the formula milk that we get at the clinic so we pour into another container, they get concerned as to why you are not breastfeeding"* (N17_KHA_RF_HIV+)

Participants reported that friends and family would frequently enquire into the reasons why a mother is not breastfeeding, and that mothers are expected to provide a valid reason for not breastfeeding. Some participants who initially chose to feed formula exclusively reported that these suspicions pressured mothers to breastfeed to prove to others that they can breastfeed. On the other hand, breastfeeding exclusively also raised cause for suspicion and curiosity from the community. Some participants believed that if they breastfeed exclusively, people will think they are HIV-positive and become judgmental.

> *"When you decide to breastfeed for 6 months because you believe that is the best nutrition for your baby people judge and make assumptions that you are HIV-positive"* (M02_FGD1_KHA)

> *"People become so curious why am I only breastfeeding and not feeding my baby other foods"* (M01_FGD2_KHA)

Participants were aware of the risks associated with mixed feeding for infants of HIV-positive mothers through the advice they received from health care workers. They regarded this risk to be less pronounced for infants of mothers who are HIV-negative. As a

result, exclusive feeding was frequently associated with an HIV-positive status, since mixed feeding was acceptable outside the context of being HIV-positive. Participants in Zithulele frequently mentioned the dangers of mixed feeding specifically for infants born to HIV-positive mothers:

> *"The fact that mothers have to choose between breastfeeding and formula feeding only and not mix both ways of feeding the baby otherwise that will increase the chances of infecting your child"* (M13_ZIT_EBF_HIV+)

> *"...they* (HIV-positive mothers) *should choose one method of feeding if they breastfeed they should they should stick to that only or if they choose to feed formula milk they should stick to that"* (M0*_FGD3_ZIT).

4.4 Conclusion

The study's focal questions elicited many opinions and reactions from participants concerning the difficulties, pressures and responsibilities associated with infant feeding. The voices of health care workers and family members were prominent throughout discussions of different methods of feeding, cultural norms and beliefs about HIV and infant feeding. All of the participants obtained advice and input about infant feeding from family members, friends, partners, or health care providers. Participants seemed keenly aware of what others thought about their feeding practices. Many of the participants reported mixed or negative reactions to their decisions from family members or the wider community. Above all, participants expressed a desire for their infants to be healthy and to grow well. These results serve as the starting point for a more focused discussion in Chapter 5 on how the themes contribute to our understanding of the barriers and facilitators to exclusive breastfeeding in the two study communities and how these findings are supported or contradicted by the existing literature.

Chapter 5
Discussion

5.1 Summary of Main Findings

The study has shown that promoting EBF and encouraging adherence up to six months remains a complex issue in communities where mixed feeding is the norm and stigma accompanies exclusive feeding practices. Only 30% of participants reported that they were breastfeeding exclusively at the time of the interview. Mixed feeding was the most commonly reported practice and the majority of infants (70%) received formula milk and/or complimentary foods. Although most infants received breast milk at some point since birth, close to a third of infants were no longer receiving any breast milk between three and four months of age. Breastfeeding cessation, formula supplementation and the early introduction of complimentary foods have been documented by other studies conducted in South Africa (Doherty et al., 2012; Goosen et al., 2014; Ijumba et al., 2014; Siziba et al., 2015) and sub-Saharan Africa (Arts et al., 2011; Buskens et al., 2007; Kakute et al., 2005).

In line with prior research, my findings indicate that infant feeding practices were influenced by personal experiences (Burns, Schmied, Sheehan, & Fenwick, 2010; Hoddinott et al., 2012), the infant's response to feeding (Howard, Lanphear, Lanphear, Eberly, & Lawrence, 2006; Wasser et al., 2011), the health system (Haroon et al., 2013; Rollins et al., 2016), involvement of other caregivers (Bezner Kerr et al., 2008; Bland et al., 2002), fear of HIV transmission and the social stigma associated with exclusive feeding (Chisenga et al. 2011; Thiaru, Pelto, Rollins, Bland, & Ntshangase, 2005). Convention, cultural norms and community perceptions were also prominent (Kroeker & Beckwith, 2011; Sibeko et al., 2005). Furthermore, practical factors such as travelling away from home, separation from the infant and available formula or food supplies also played an

important role in determining feeding practices (Coutsoudis et al., 2008; Goosen et al., 2014; Sheehan et al., 2010). A wide-spread belief in both communities was that exclusive feeding (either EBF or replacement feeding) is associated with an HIV-positive status. This association was reinforced by the current feeding practice of HIV-positive mothers in the study; although mixed feeding was the most commonly practiced feeding method in the total sample, the majority of HIV-positive mothers practiced exclusive feeding. Mixed feeding was considered a risky practice for HIV-positive mothers but not to the same extent for uninfected mothers. As a result, exclusive feeding was frequently associated with an HIV-positive status, since mixed feeding was an acceptable practice outside the context of being HIV-positive (Young et al., 2011).

Mixed feeding was the norm in both peri-urban and more remote rural areas, as reported by other studies conducted in South Africa (Buskens et al., 2002; Goosen et al., 2014; Kruger & Gericke, 2003; Mamabolo et al., 2004). As an alternative to mixed feeding, EBF was more common in Zithulele and replacement feeding more common in Khayelitsha. This may be due to timing of policy change and different intervention strategies implemented in the two areas. In 2006, Zithulele hospital was one of the first health facilities to change their policies to encourage EBF for all mothers (Malan, 2011), while the Western Cape government released their breastfeeding restoration plan five years later (Western Cape Government, 2011).

While the study set out to explore differences between the rural and peri-urban study communities, the analysis identified only minor differences in infant feeding practices between study sites, whereas beliefs and sources of influence were remarkably similar across rural and peri-urban study settings. This may be due to the high levels of migration of women from the Eastern Cape to Khayelitsha. One of the main reasons why women

migrate from the Eastern Cape to peri-urban areas such as Khayelitsha is to seek employment (Laurenzi, 2015), which could also affect a mother's ability to breastfeed and increase the likelihood of replacement feeding (Dearden et al., 2002; Rollins et al., 2016). Several barriers were identified that prohibit mothers from practicing EBF and contributes to the explanation for low EBF rates in South Africa. The themes and subthemes identified in the analysis have informed the following discussion of the barriers and facilitators to EBF.

5.2 Barriers and Facilitators to Exclusive Breastfeeding

5.2.1 Self-efficacy and infant feeding success. Mothers who did not experience difficulties with breastfeeding and who experienced that their infants were growing well were motivated to adhere to EBF. Replacement feeding or the discontinuation of breastfeeding was often contrary to a mother's initial plan. Mothers who experienced early breastfeeding difficulties such as breast engorgement, sore or cracked nipples and mastitis were more likely to introduce formula milk or other foods to the infant's diet. There is evidence from other populations that early lactation difficulties lead to supplementation (Li, Fein, Chen, & Grummer-Strawn, 2008; Perez-Escamilla, Segura-Millan, Canahuati, & Allan, 1996), which in turn leads to early breastfeeding cessation (Guigliani et al., 2008). Similar to research from Indonesia (Susilorethni, Hadi, Prabandari, Soenarto, & Wilopo, 2015), Tanzania (Nkala & Msuya, 2011) and Egypt (Gwass & Ahmed, 2011), women who did not experience breastfeeding problems would exclusively breastfeed longer than mothers who had breastfeeding difficulties. In contrast, a study of Peruvian mothers did not find lower rates of EBF among mother-infant dyads who experienced breastfeeding problems (Matias, Nommsen-Rivers, & Dewey, 2012). This suggests that in populations where there is strong cultural support to protect breastfeeding, mothers may be more likely

to overcome early problems and continue (or resume) EBF. Similarly, UK studies of young mothers who decide to breastfeed (Brown, Raynor, & Lee, 2009) and mothers who breastfeed for at least six months (Brown, Raynor, & Lee, 2011) indicate that determination is a key characteristic of their experience. Determined mothers often breastfeed despite experiencing feeding difficulties (and negative attitudes of others), rather than in the absence of these problems (Trickey & Newburn, 2014). This speaks to how early support for mothers to deal effectively with early lactation problems can improve EBF adherence.

Feeding experiences differed among participants in that mothers ultimately dealt with failures and successes differently and adapted feeding practices based on their circumstances and the infant's reaction to feeding. While health provider messages informed knowledge about optimal feeding, findings indicated that women encountered divergent guidance from family or peers, and ultimately decided based on their own understanding of what feeding practice was feasible for them and their infants. In accordance with existing literature (Heinig et al., 2009; Nelson, 2006), mothers reported doing what worked even if the behaviours conflicted with professional advice related to optimal infant-feeding behaviours, or contrary to community norms and pressures. Positive experiences encouraged participants to continue with their chosen feeding practice, while negative experiences, such as infant illness or weight loss, encouraged mothers to try something different. An interesting finding was that infant illness associated with formula milk in particular (either with older children or other children in the household/community), encouraged some participants to avoid formula feeding and adhere to EBF. Despite a pervasive belief in the community that breast milk only is not sufficient for infant nutrition, those who managed to adhere to EBF frequently reported that they were satisfied with their infant's health and weight, and that this encouraged them to continue. A meta-synthesis of

qualitative breastfeeding studies reported that positive infant reactions to feeding motivated mothers to continue breastfeeding, despite experiencing discomfort and difficulties (Nelson, 2006). This highlights the value of increasing mastery experiences (e.g. succeeding at previous breastfeeding experiences or overcoming breastfeeding problems) and vicarious experiences (e.g. coming into contact with mothers who breastfeed successfully and who can attest to its benefits for infants) in communities (de Jager et al., 2013).

Challenges remain on how to ensure that mothers are adequately prepared to manage problems that may arise during the infant feeding period. Interventions are needed that enable mothers to arrive at possible solutions to stressful circumstances or infant behavioural issues (Heinig et al., 2006). Black and colleagues (2001) have reported the success of such an intervention among adolescent mothers. When provided with education and tools to deal with barriers, mothers in the intervention group were four times more likely than those in the control group to follow paediatric infant feeding guidelines. A recent systematic review, which specifically examined psychosocial factors and EBF duration highlighted the importance of psychosocial factors on a women's ability to maintain EBF to six months (de Jager et al., 2013). In particular, psychosocial factors such as self-efficacy, postpartum depression and maternal breastfeeding intentions have been shown to be strong predictors of EBF outcomes (de Jager et al., 2013; O'Brien, Buikstra, & Hegney, 2008). Mothers with high self-efficacy are more likely to initiate breastfeeding, persist when they experience difficulties, adopt self-encouraging thoughts and are more likely to react positively and be able to overcome difficulties (Bandura, 1977; Dennis, 1999).

5.2.2 Concerns about breast milk sufficiency and infant weight. A pervasive belief was that infants cannot be satisfied by breast milk alone and that they need formula milk or other foods to relieve hunger and to help the infant grow. This belief undermined

the practice of EBF in both communities. The perceived insufficiency of breast milk was the most commonly reported reason for introducing formula milk or complimentary foods to the infant's diet. Insufficient milk supply has been documented as one of the most common reasons women give for breastfeeding cessation (Li et al., 2008; Meedya, Fahy, & Kable, 2010; Nelson, 2006) and for introducing supplemental formula milk (Gatti, 2008; McCann & Bender, 2006). Only about 5% of women actually have physiologic insufficient milk supply, although up to 50% report that they perceive insufficient milk for their infants (Hector, King, & Webb, 2005). This perception often coincides with unsettled infants, slow weight gain, and the need for frequent feedings (Walker, 2002). Infant behaviour, most commonly infant crying, frequently influenced feeding practice, even if the practice was not perceived by the mother to be the healthiest option for the infant. Similar to findings by Lakshman et al. (2011), mothers tried to follow the recommended quantities of formula milk, but also decided based on the infant's appetite, in response to crying, or to get them to sleep longer. Infant crying or fussiness, perceived hunger, and the inability to console the infant often cause a mother to assume that she has insufficient milk and to introduce breastmilk substitutes (Howard et al., 2006; Wasser et al., 2011). Perceived breast milk insufficiency influenced how mothers interpreted infant crying, especially after breastfeeding. This finding is consistent with research from Uganda (Engebretsen et al., 2010), Malawi (Levy, Webb, & Sellen, 2010), Swaziland (Shongwe & Mkhonta, 2014) and Zambia (Fjeld et al., 2008; Hazemba, Ncama, & Sithole, 2016). This perception, along with limited understanding of how to manage infants with childhood ailments, could potentially motivate mothers to introduce formula milk or other foods (Hazemba et al., 2016).

Infant weight gain and growth also determined whether participants adhered to, or changed from, their initial feeding practice. Despite the recommendation from health

facilities that infants should only be introduced to solid foods after six months, participants believed that introducing more frequent formula feeds or soft foods alongside breast milk before six months of age would accelerate infant weight gain. When so much emphasis is placed on infant weight gain from both professionals and friends and family, mothers become increasingly aware of how much their infant is feeding and how much weight they gain. The early introduction of solid foods may indeed increase infant weight gain (Baker, Michaelsen, Rasmussen, & Sorensen, 2004). Results from a prospective, observational study with 3768 mother–infant dyads reported that infants who are fed on solid foods before four months are likely to gain more weight from birth to one year compared to infants started on solid foods after four months (Baker et al., 2004). Increased weight gain made mothers feel proud and secure that their infants were growing well (Brown et al., 2011). As reported in other studies (Lakshman et al., 2011) mothers were more likely to be worried about underfeeding than overfeeding their infants. In this study, concerns about not feeding the infant enough were common, while almost no mothers showed concern about feeding an infant more than necessary. Rapid weight gain during the first months of life increases a child's risk of becoming overweight later in childhood and increases the development of childhood obesity (Adair, 2008; Stettler, Zemel, Kumanyika, & Stallings, 2002). This finding needs to inform future infant feeding interventions to prevent childhood obesity (Redsell et al., 2010), especially in LMICs where its prevalence has accelerated significantly in the past ten years (WHO, 2014). Nutrition transition, being experienced in LMICs undergoing rapid economic transition and urbanisation, is a major driving force behind the increase in levels of obesity in LMICs, despite persistence of undernutrition (Popkin & Adair, 2012; Popkin, 2003). In order to address the dual burden and improve the health of children, improved feeding programs are needed that consider both undernutrition and

overnutrition in intervention design (Tziourmis & Adiar, 2014). These interventions need to address mothers' beliefs that infants cannot be overfed, that crying always signals hunger and that growth is determined by genes rather than nutrition (Lakshman et al., 2011). Reframing mothers' perceptions of a healthy infant, and the understanding of normal infants' behaviours and development, may help mothers deal with perceived issues in ways other than overfeeding and introducing complimentary food before six months (Horodynski et al., 2007).

5.2.3 Acceptability and availability of formula milk. The use of formula milk to feed young infants was seen as a normal and accepted practice in both the rural and peri-urban study sites. This was prominent in Khayelitsha, where 14 participants reported that they used formula milk as a substitute for breast milk, compared to only two participants who used replacement feeding in Zithulele. However, despite Zithulele's remote and rural location, formula products were easily accessible, and many mothers combined formula feeding with breastfeeding. While the reasons for longstanding use of formula milk are complex, the distribution of formula milk contributed to normalising formula feeding practices in South Africa (Hendricks, le Roux, Fernandes, & Irlam, 2003; Ijumba et al., 2013). The increased availability of infant formula has influenced feeding beliefs and practices in various ways, and ultimately undermines EBF as a normative practice in these communities. Smith (2004) confirms that breastfeeding decisions and behaviours are influenced by markets supplying low cost milk alternatives to human milk. Marketing efforts increase the perceived trustworthiness of these products, which counteracts the notion that formula feeding can be dangerous for infants. The marketing and availability of infant formula seems to have normalized its use in these communities, further preventing mothers from trusting in the adequacy of EBF (Ijumba et al., 2014).

Although infant formula products were widely available in both communities and recognised as a suitable food for young infants, the majority of mothers did not have the financial means to afford a sustainable supply of formula milk for their infants (Faber et al., 1997; Ijumba et al., 2014; Thiaru et al., 2005). Households often ran out of formula towards the end of the month, which contributed to the practice of mixed feeding. The use of formula products in contexts of financial instability leads to risky feeding practices (Ijumba et al., 2014), especially for mothers who can no longer breastfeed. When formula products are readily available and seem easily accessible, mothers may be encouraged to opt for formula feeding in response to breastfeeding problems. Although support for formula use, as and when mothers feel they want and need it is essential to the common objective of well-supported mothers (WHO, 2003a), there is still a need to prevent formula milk from being used as a 'quick fix' when mothers would prefer to have support to breastfeed. Trickey and Newburn (2014) argue that this danger is lessened if feeding support is provided in an environment free of commercial and time pressures by structures equipped to enable breastfeeding and show acceptance of mothers' decisions.

The use of formula in health facilities undermined EBF, especially amongst HIV-positive mothers. Formula supplementation without medical justification violates the WHO International Code of Marketing Breastmilk Substitutes (WHO, 1981). According to South Africa's most recent Infant and Young Child Feeding Policy (Department of Health, 2013), public health facilities will only provide infant formula as part of the supplementary feeding programme to "infants who have specific medical conditions" (p. 16). The policy states that the provision of free commercial formula to women with medical conditions should not undermine breastfeeding promotion efforts (Department of Health, 2011). In Khayelitsha, having the option to receive formula from the clinic seemed to undermine breastfeeding for

HIV-positive mothers, and formula milk provided by health facilities were used inappropriately by other mothers in the community. Research shows that mothers are more likely to discontinue EBF if health providers suggested the use of formula supplementation (Susiloretni et al., 2015). As institutional delivery rates continue to rise, hospital practices will play an even greater role in accelerating optimal breastfeeding practices.

5.2.4 Time demands of infant care. In this study formula feeding or mixed feeding was preferable to EBF, because it gave the mothers more flexibility in terms of feeding variety and in sharing child care responsibilities with family or neighbours. Maternal employment is a strong predictor of early EBF discontinuation (Matias et al., 2012). Studies report that maternal employment has negative effects on breastfeeding duration (Dearden et al., 2002; Ogbuanu et al., 2011; Ong, Yap, Li, & Choo, 2005) and that women planning to return to work after childbirth are less likely to begin or continue breastfeeding. A widely-held belief in both communities was that EBF was not possible for employed mothers, mothers seeking employment or mothers returning to school after giving birth. Introducing formula milk and other foods allowed mothers to resume economic activities without a prolonged break. Mothers overburdened by infant and child care and the need to generate household income may respond to time or material resource constraints by reducing breastfeeding despite its health and nutrition benefits (Smith & Forrester, 2013). The notion that mixed feeding is less demanding on maternal lifestyle than EBF acts as a barrier to choosing this feeding practice. Adding other foods to the infant's diet facilitates sharing infant care with others, therefore relieving the mother from constant responsibility of providing breast milk for the infant. Smith & Forrester (2013) emphasized the substantial time taken for EBF at around 6 months (18.2 hours weekly or 2.6 hours daily) and the much lower time spent on infant feeding activities among mothers who had introduced formula

or solid foods to the infant's diet. Breastfeeding exclusively complicated separation between mothers and their infants, which often motivated the use of formula feeding and complimentary feeding.

In both communities, child care responsibilities are typically shared by multiple caregivers, which complicates the practice of EBF for up to six months. Many women believed that EBF was not feasible because others were involved in child care activities, who would then find taking care of the infant difficult if the mother was only breastfeeding. Formula feeding allowed other people to feed the infant when the mother is away. Other people wanted to share in the care of the infant, particularly feeding, and pressurized the mother into letting them do so. Involvement of other caregivers in the feeding process enforces mixed feeding as the cultural norm and further undermines EBF. Personal priorities, pressures from family, social and domestic demands all compete with the commitment, confidence and time required to adhere to EBF for six months (Trickey & Newburn, 2014). Problems may also be compounded by conflicting expectations and maternal exhaustion in a social context that places little emphasis on rest and recovery after the birth (Dodds & Newburn, 2010).

5.2.5 Competing biomedical and socio-cultural concerns. Difficulties in adhering to EBF arise when a mother's chosen practice contradicts the norms and practices of the family and wider community (Eamer & Randall, 2013; Lazarus et al., 2013; Saloojee & Cooper, 2010). In this study, adhering to EBF contradicted with the normative feeding practices (mixed feeding) in the families and wider communities. According to Göksen (2002), these norms influence and direct behaviour and implicitly provide support in the form of approval to those who conform. In this study, conflicting information on infant

feeding and support for different practices from different sources was a recurrent issue to emerge, as identified by others (McInnes & Chambers 2008; Thomson & Dykes, 2011). These insights suggest that the changing recommendations on infant feeding have led to women receiving different information from sources such as health professionals and personal networks. While discourses about advice from health care workers were prominent in discussions about initial decision-making around how and what to feed the infant, the role of the family became more important with time or when the mother began to experience difficulties.

Decision-making on infant feeding is not only based on knowledge about health risks, but also on the social risks regarding judgement, rejection or stigma that may accompany a chosen feeding practice (Leshabhari et al., 2007). Family and community values compete with the optimum health ideal of exclusive breastfeeding for the first six months (Hoddinott et al., 2012). Similarly, a study of perceived food value and preferences regarding appropriate young child feeding practices among working mothers in Mexico reported that programme designers had differing perceptions and values, compared to mothers at the receiving end of feeding recommendations (Rodriguez-Oliveros, Bisongni, & Frongillo, 2014). Much as the women in the study showed awareness of optimal infant feeding practices, mothers experienced that it was not always practical or possible to adhere to recommended practices because of socio-cultural and socio-economic factors, the prevalence of which have been documented in other studies (Ijumba et al., 2014; Lazarus et al., 2013). Women are expected to respect the family's culture and the corresponding advice about childbearing. At the same time, a growing number of women also receive cutting edge maternal care information from health facilities, which focuses mostly on the mother's and the infant's physical health. Family recommendations, on the other hand, usually centre

around cultural and social considerations. As a result, feeding recommendations today are followed in a fragmented way, as biomedical concerns become more widely known (Kroeker & Beckwith, 2011).

The advice given by counsellors to breastfeed exclusively for three, four, or up to six months entails substantial apprehension for many mothers, as it goes against local norms of early supplementation of water, formula milk and porridge. The tension between medical and social concerns, and between risk and reputation, put HIV-positive women in a particularly demanding situation with respect to infant feeding choice (Leshabhari et al., 2007). Mothers who were themselves HIV-positive and breastfeeding exclusively appeared to understand that ART reduced the risk of MTCT through breast milk and hence recognized its benefits for their exposed babies. Despite this understanding, some mothers doubted the safety of breast milk for their HIV-exposed babies even when taking ARVs, while others regarded it as a safer option. These two divergent perspectives on the part of mothers may have risen from inadequate information and lack of understanding of EBF in the context of PMTCT of HIV (Hazemba et al., 2016). The findings also revealed that the desire to protect their infants from HIV infection most motivated mothers to adhere to EBF despite pressures from the family who lacked knowledge and understanding of EBF (Mphego, Madiba, & Ntuli, 2014).

To explain the failure of women to initiate or to persist in EBF, the literature has consistently mentioned the importance of social support as an influential variable affecting the intention, incidence and duration of EBF (Bowman, 2013). Family members, particularly grandmothers, often played a negative role with regard to the duration of EBF as they tended to promote the use of other food than breast milk – in line with other studies (Agunbiade & Ogunleye, 2012; Duong, Binns, & Lee., 2004; Susilorethni et al. 2015). In

this study, very few women reported that their families were supportive towards the practice of EBF. While counselling on infant feeding by health care workers usually involve mothers and occasionally fathers, the findings highlight the importance of reaching families and peers who play a major role in influencing feeding practices. Strategies geared to promote EBF need to include these significant others in households and communities (Department of Health, 2013; Ijumba, 2014). Involving family members in training or parenting education could enable them to provide helpful support to mothers who want to breastfeed exclusively (Grassley & Eschiti, 2007; Ingram, Johnson, & Hamid, 2003; Susiloretni et al., 2013).

5.2.6 Stigma associated with exclusive feeding.

In both settings, the choice of exclusive feeding posed threats to a mother's exposure as HIV-positive. As confirmed by Young et al. (2011), participants from both sites acknowledged that the general belief in the community is that if a mother does not breastfeed, people will assume that she is HIV-positive. Exclusive formula feeding was also stigmatizing because the community was aware that many HIV-positive women receive free formula from the health facilities. Since the earlier national feeding policies (which have since been updated), recommended that HIV-positive women should avoid all breastfeeding, knowledge of HIV transmission through breastfeeding has been disseminated into local communities. As a result, a woman who opts for exclusive formula feeding will be carefully watched. Similarly, since updated feeding policies, interventions and health provider messages emphasise EBF as a practice that is particularly important for HIV-positive mothers and their infants, many people now also associate EBF with HIV. Previous counselling regarding breastfeeding by health care workers have emphasised strict EBF followed by rapid weaning for HIV-positive women, and emphasised the importance of

avoiding mixed feeding (Department of Health 2007; WHO, 2003b). Knowledge about the risk of mixed feeding for infants of HIV-positive mothers has meant that EBF is increasingly associated with an HIV-positive status.

Some participants were concerned that people in their community might assume they are HIV-positive if they breastfeed exclusively and avoid mixed feeding. This was a problem for both HIV-positive and HIV-uninfected mothers who wanted to breastfeed exclusively. Participants were aware of the risks associated with mixed feeding for infants of HIV-positive mothers through the advice they received from health care workers. They regarded this risk to be less pronounced for infants of mothers who were HIV-negative. As a result, exclusive feeding was frequently associated with an HIV-positive status, since mixed feeding was acceptable outside the context of being HIV-positive. These findings suggest that the recommended feeding options may be difficult to adhere to, whether a mother chooses EBF or exclusive replacement feeding (Leshabhari et al., 2007). Even though breastfeeding is culturally important, breastfeeding exclusively elicited negative judgements in the community. Only more recently has EBF been emphasised for all mothers, regardless of serological status (Department of Health, 2013). Mothers living with HIV who decide to practice EBF face the risk of stigma from their family and community, as reported in other studies (Nor et al., 2012; Thiaru et al., 2005; Zulliger et al., 2013).

5.3 A Systems Analysis of Exclusive Breastfeeding

Bentovim's diagram of breastfeeding as a social system (Appendix A) provided the theoretical framework for developing a similar system structure for EBF. Like Bentovim's diagram, the adapted diagram illustrates how interactions between individual, social, cultural and structural factors may motivate or prevent adherence to EBF. These factors do

not function in isolation, but interact dynamically to influence infant feeding behaviour. The following quotation illustrates this interplay of factors:

> *"...I am breastfeeding, but mid last month I started to introduce formula milk to my child as I realised that he is not getting enough from breast milk and people advised me to feed him formula milk and told me that I am starving him but breast milk is the best because I have never been to the hospital because of my child's ill health but most that were born after him already have chest problems"*
> (V13_KHA_MF)

This participant's personal view that her infant is not satisfied with only breast milk is reinforced by the comments she received from others about starving her infant, which motivated her choice to introduce formula milk to her infant's diet. Her decision was further strengthened by the advice she received from people in her social network to formula feed. However, changing her feeding method conflicted with her belief that "breast milk is the best". It also conflicted with her experience of feeding her infant only breast milk and observing that the infant has been healthy ("never been to hospital") compared to other infants who receive formula milk. Despite this experience, the participant introduced formula milk to her infant's diet and started mixed feeding. Personal, social, cultural and health related factors interacted in a specific way, which ultimately resulted in her changing from EBF to mixed feeding. The framework developed for the study (Figure 4) proposes different levels of factors that influence adherence to EBF. These factors may act as facilitators or barriers to EBF, similar to Bentovim's positive and negative feedback processes, and affects a mother's adherence to (or change from) her chosen feeding practice.

The study findings indicated that a mother's feeding decision is dependent on the broader cultural, economic and social context. Attributes of the family and the socio-cultural environment where the mother and child live play an important role in determining

successful EBF. These include cultural norms, traditional belief systems, the social acceptability of formula feeding and women's role in the family and wider community. The role played by health professionals and their attitudes and activities are also important here. Family and society level factors such as feeding norms and beliefs, the importance of involvement of other caregivers or the availability of formula milk products influence EBF acceptability and provides the context for feeding choices. These variables have bearing on a mother's expectations, her decisions, choices, support and possibilities of adhering to EBF.

If precipitating factors allow a mother to considers and initiate EBF, individual level factors relating directly to the mother, such as self-efficacy, capacity to deal effectively with breastfeeding difficulties, perceived breast milk insufficiency or work responsibilities may influence a mother's ability to adhere to EBF. Factors related to the mother-child dyad such as experiences of feeding successes or failures, mother's response to infant crying, illness or changes in infant weight will also make it difficult for mothers to continue with EBF. The study also showed that fear of HIV transmission, stigma associated with HIV, mixed messages on HIV and infant feeding and feeding guidelines that polarize mothers based on their HIV status acted as barriers to EBF. HIV functions on personal, familial and societal levels and may consequently influence a mother's ability to choose EBF at any level. According to the framework, if EBF is attempted, this itself has consequences for the mother, for the infant, for the family and for society. These consequences influence the original variables and the whole system can be seen to be in dynamic interaction (Bentovim, 1976). The feedback processes either energise the system, which maintains the practice of EBF, or reduces the likelihood of its success and hence increases the chances of substitution with mixed feeding or replacement feeding.

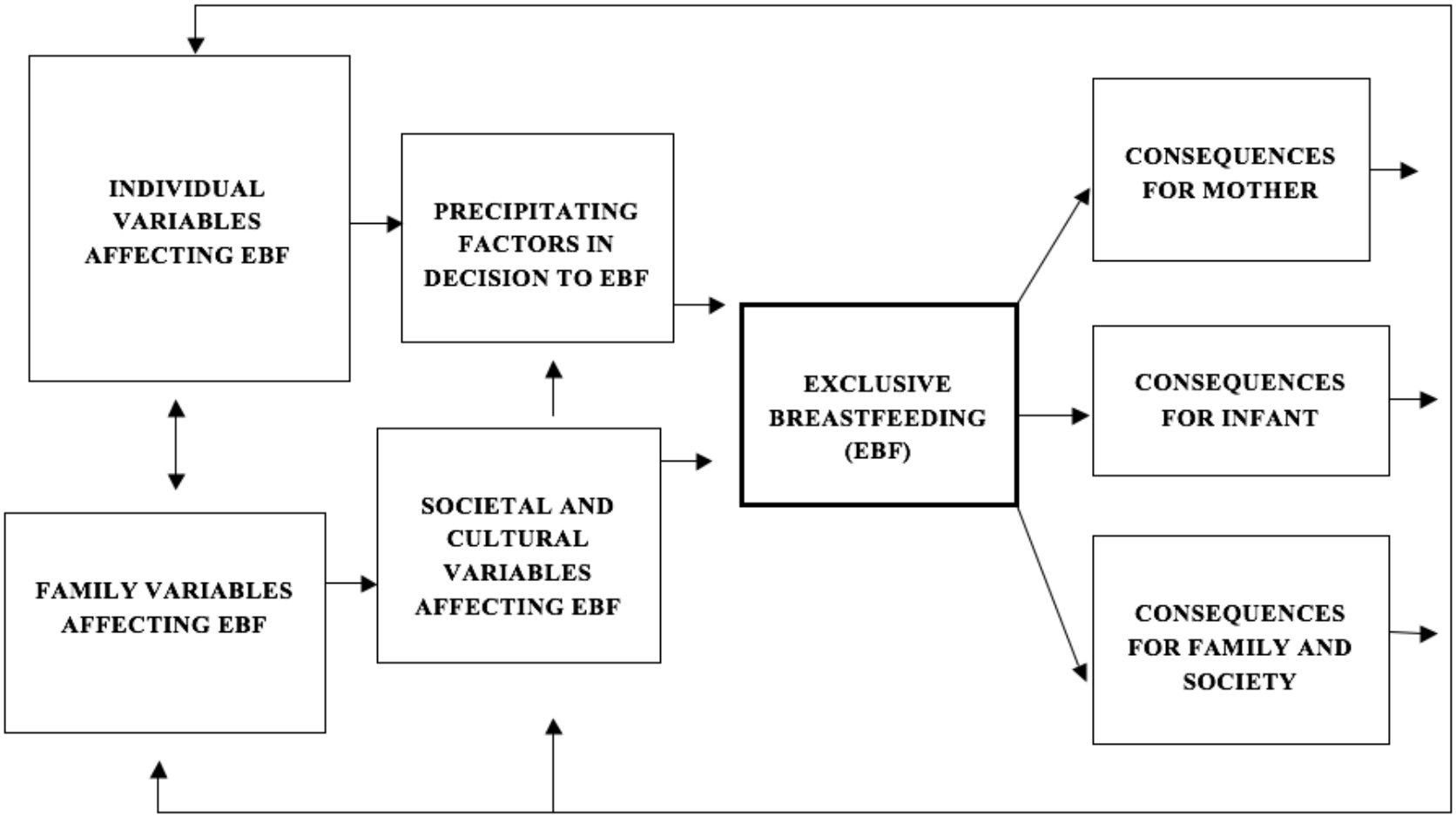

Figure 4: A systems analysis of exclusive breastfeeding

5.4 Implications for Future Research and Intervention

The findings in this study have all been confirmed by the existing literature, indicating that there is substantial research available on factors that influence EBF. The study did not present immediate solutions to the barriers to EBF within the mother's environment. However, it provided a solid foundation for future research to address how mothers could be assisted in developing the necessary skills to overcome early lactation problems, manage infant ailments and cope with their social environment more effectively in order to improve adherence to EBF.

5.4.1 Recommendations for future research. Research needs to be prioritised that focus on what strategies prove effective to increase rates of EBF, especially in LMICs where infants are at greater risk of infant illness and malnutrition associated with sub-optimal breastfeeding. South Africa needs to follow up on its commitments to improve breastfeeding rates and strive to collect national data to monitor breastfeeding rates and ensure that all health facilities actively implement the Ten Steps of the Baby-Friendly Hospital Initiative (Richter, 2016). Optimal conditions and practices for infant feeding are not always in agreement with parent beliefs and related practices. According to Paul (1955), the successful introduction of an intervention essentially entails a change in local culture, suggesting that evidence-based policy and interventions also should attend to caregiver agency if they are to improve outcomes (Worthman et al., 2016). Interventions will need to focus specifically on educating mothers and families about the risks of overfeeding in order to prevent rapid and excessive weight gain in the first months of life (Weng, Redsell, Swift, Yang, & Glazebrook, 2012). Future research endeavours that focus on designing consistent messages on infant feeding and approaches to counselling and media campaigns could be useful to encourage the practice of EBF. In order to allow for sufficient insight into what messages

are relayed at a community level and how people make sense of these recommendations, future studies could further explore the link between policy messages and people's understandings of HIV transmission through breastfeeding by including family members, partners, frontline workers and other stakeholders in research on EBF. The development and implementation of further research may benefit from the results yielded in the present study.

5.4.2 Programme and policy implications. In broadening the understanding of the present infant feeding practices, it creates the opportunity to plan and implement appropriate, cultural-specific interventions to improve existing practices. A major challenge remains how to deal with the wide variety of contextual challenges, which makes EBF difficult for mothers. For HIV-positive mothers, Ijumba (2014) stressed the need for strategies that are available in the absence of disclosure or resistance to change by family members involved in the care of infants. For example, strategies and support which aim to address the day to day practical challenges that come with breastfeeding such as what to do if mothers get ill and is unable to breastfeed, or develops breast problems or has to leave her child with someone else need to be emphasized and incorporated in antenatal counselling. Health services formulating policies need to proactively facilitate communities to establish a supportive EBF environment in order to make this a realistic choice for both HIV-uninfected and infected mothers who wish to breastfeed. Establishing partnerships with local healers and other community figures to address knowledge and beliefs in the community at large could contribute to an enabling environment for women to choose and adhere to EBF. Integrated media-campaigns, school- and workplace interventions will also be imperative to ensure that all mothers receive the opportunity and support to choose and adhere to EBF.

The effectiveness of incorporating breastfeeding counselling within the healthcare system has been well recognised in the Baby Friendly Hospital Initiative (WHO & UNICEF, 2009). However, for sustained impact, support must move beyond the hospital environment into the communities where mothers face the biggest challenge to continue with the practice (Lartey, 2008). More effective results have been reported when maternal education is given as part of a multicomponent intervention, which includes breastfeeding support from the family, hospital, community and at the work place (Merewood, 2014; Rollins et a., 2016; Seifu et al., 2013; Skouteris et al., 2014). Community-based support is an important follow-up strategy to facility-based support to ensure continued EBF (Aidam, Perez-Escamilla, & Lartey, 2005; Bhandari et al., 2003). Community care worker programmes such as the Mentor Mothers programme that forms part of community-based services play an important role in promoting EBF, infant growth and health (le Roux et al., 2010). Enabling interventions operate by removing structural and societal barriers that interfere with women's ability to breastfeed optimally (Rollins et al., 2016). Examples include maternity and workplace policies or regulations to restrict marketing of breastmilk substitutes and baby-friendly hospital certification. Women need to be supported to be able to work or attend school and still breastfeed. Research shows that national policies that guarantee paid breastfeeding breaks at least until an infant turns six months old significantly increases rates of EBF (Heyman, Raub, & Earle, 2013). In order to breastfeed successfully, women must have access to all services that protect, promote and support breastfeeding (Holla-Bhar et al., 2015). The results from this study could be used to formulate acceptable recommendations to address barriers in order to move closer to optimal infant feeding practices.

5.5 Limitations of the Study

The findings from the study should be considered in light of its methodological limitations. Participants at both study sites were recruited through existing research studies that in some way promote EBF. Data on infant feeding practice was collected through self-reporting. In interpreting the results, it is important to consider the possibility of a social desirability bias. Participants may have given desirable responses, since they believed the data collector would want to hear them speak about infant feeding in a particular way. The method of sampling may have resulted in the study not getting access to mothers who are more serious defaulters from safe feeding practices or who received limited input or advice about EBF. This may limit transferability to other communities where there is less active promotion of EBF. For example, in Zithulele, mothers who were interviewed lived within the area serviced by Mentor Mothers who conduct home visits and guidance on safe infant feeding practices. The findings may therefore not be as representative of the wider community of mothers who do not receive intervention on infant feeding. Future research might expand further on the population from which the sample was recruited.

The data collectors were new to qualitative interviewing, which may have affected the quality of some interviews and consequent discussions with some participants. While reviewing the transcribed interviews, there were instances where responses could have been explored or clarified further. Data collectors occasionally struggled to prompt participants to elaborate on certain topics. Because of the length of time it took to transcribe and translate the interviews, all transcripts could not be analysed in time to give concrete input for the following interviews, and I had to rely on the feedback from data collectors after each interview. Another limitation was linked to translation. I analysed data from transcripts that

had already been translated from isiXhosa to English. The translation process may to some extent have altered the original meaning of the text.

5.6 Conclusion

The study identified important issues and challenges that mothers face which require further attention in order to improve infant feeding practices in South African communities. The findings highlight the importance of preparing mothers for familial and community pressures that encourage mixed feeding and the cultural influences that conflicts with EBF recommendations. It is important to recognise that mothers have not one but numerous simultaneous concerns related to infant feeding, and this is especially the case in contexts with high rates of HIV and infant illnesses. The perceived association between EBF and an HIV-positive status needs to be contested as it undermines the promotion of EBF as a healthy option that can benefit all children. Large-scale promotion of EBF and explicit demotion of mixed feeding needs to be prioritised. Breastfeeding intention was prevalent in both study communities, although not necessarily the intention to breastfeed exclusively. This holds promise in terms of promoting breastfeeding, but EBF will need to be emphasised to prevent mixed feeding among HIV-infected and uninfected mothers. An understanding of the barriers and facilitators to EBF is an essential focus-point in order to encourage EBF for all mothers in South Africa.

The findings point to the significance of combining instrumental, social and informational support as enabling factors that will help translate intention into behaviour (Göksen, 2002). In line with a systems theory approach, interventions that seek to improve EBF rates should not function in isolation, but strive to provide consistent messages and services across all sectors, in order to effectively influence safe infant feeding practices. In

countries where rapid improvement in EBF rates have been reported, such as in Bangladesh, Brazil, Cuba and Togo (Rollins et al., 2016), collaboration among the stakeholders and sectors in addressing the contributing factors correlated directly with the overall success of nutritional interventions (International Food Policy Research Institute, 2014). Promotion of EBF should not be confined to teaching about the health benefits of EBF but should include teaching mothers how to access support as well as teaching social networks to provide mothers with the support they need. Strategies that can engage mothers, their families, communities and the health facilities that service them in a dialogue on infant feeding and child survival will be essential. Until national policies on infant feeding proactively address the barriers that result from the beliefs and practical constraints that limit the feasibility of EBF, effective policy implementation will remain out of reach for countries like South Africa (Eamer & Randall, 2013). A new intervention concept needs to be introduced that covers several enabling factors, such as the availability and reliability of structural, instrumental and social support in addition to changing attitudes and subjective norms. A consistent, integrated intervention approach would help to provide the conditions conducive to EBF adherence.

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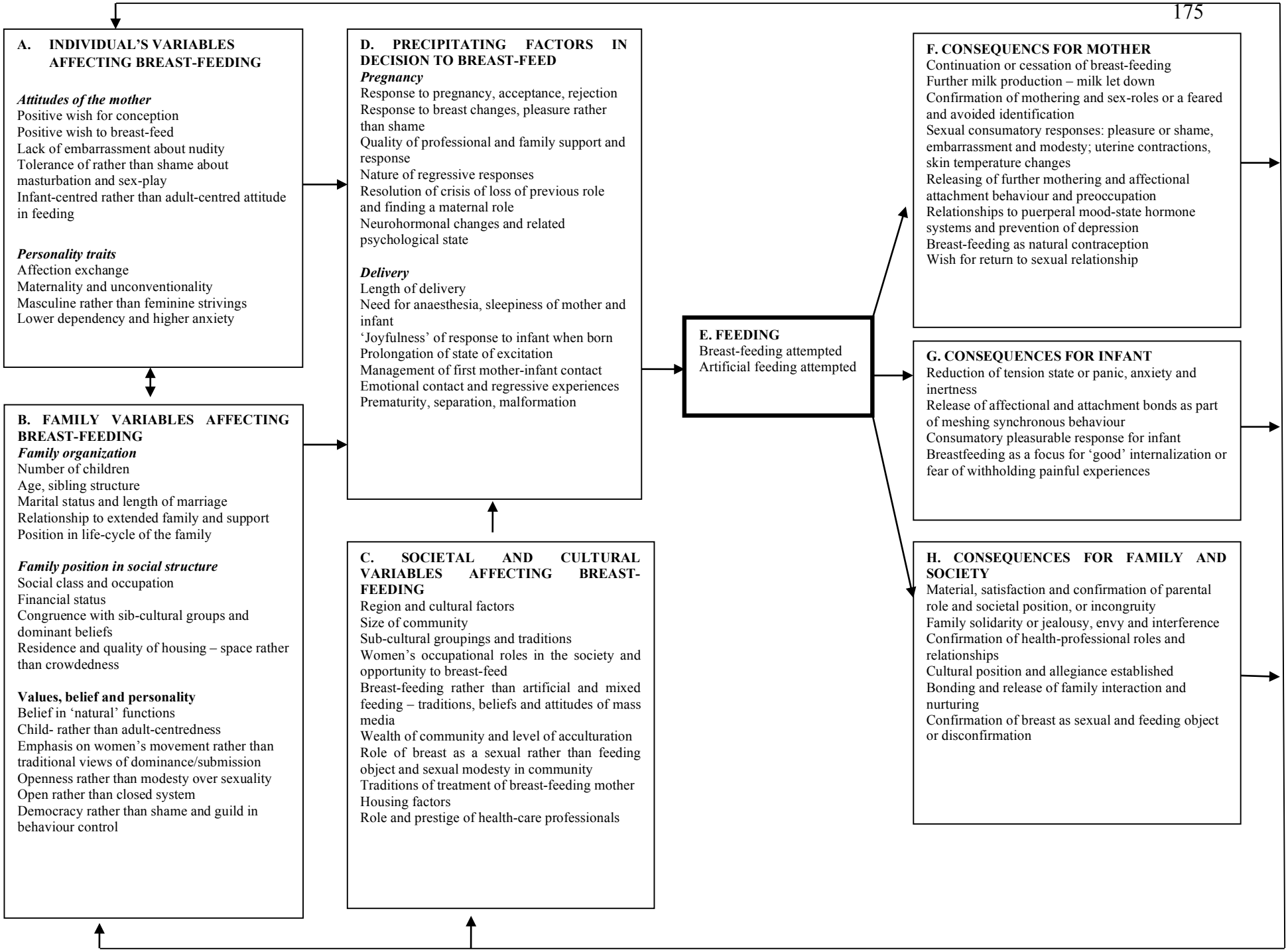
List of Appendices

Appendix A

Bentovim's diagram of breastfeeding as a social system (1976):

Breast-feeding; the elements of a social system (next page)



Appendix B

Guiding questions for individual interviews

Individual Interviews – Guiding Questions:

What do you think is the best way to feed a baby for the first six months? (Can you tell me why you think that? Who told you that this was the best way and what did they say? Tell me why do you agree with that?)

Tell me about how you decided to feed your baby. (Did you already think about how you wanted to feed your baby when you were pregnant? After the baby was born, is that how it worked out? What was important for you when deciding how to feed your baby? What did you want for your baby?)

How are you feeding your baby? Can you tell me why you decided to feed your baby that way? (How do you feel about this way of feeding your baby, how is it going? How do you feel about how your baby is growing and his health?)

What are the challenges that you are faced when feeding your baby?

How do you feel about breastfeeding? (What was easy or difficult about it? What were you told about breastfeeding? How was it for you to breastfeed your baby?)

If you use formula - (Why is it important to you to give formula to the baby? Can you afford to pay for the formula milk every month? How do you prepare the formula milk? Do you add anything to the formula milk to make it last longer? How easy is it to buy formula milk here? What is easy or difficult about providing and preparing formula for the baby?)

What do other people – your family, other mothers or the rest of community say about how you decided to feed your baby? (Do they comment on this? How has this affected you? How is the father of the baby and your mother/mother-in-law involved in the feeding of your baby? How do they think you should feed your baby, what have they told you about what to do and why?)

What did the doctors and nurses at the hospital tell you about how to feed your baby? (How did this affect your decision of how to feed your baby? What do you think about what they told you?)

Do you believe that you can have sex if you are still breastfeeding your baby? (What do people in the community say about sex and breastfeeding?)

How important is the size/weight of the baby to you? (What do people say about a big baby, or a small baby? What makes a baby to grow big? Is this important to you?)

How do other mothers in this community feed their babies? (Why do you believe mothers are doing it this way? Is breastfeeding important here? What do people believe about breastfeeding? What do people in the community believe about HIV and breastfeeding?)

Appendix C

Guiding questions for focus groups

Focus Groups – Guiding Questions:

How do mothers in this community feed their babies? Why do you believe mothers are doing it this way?

Is breastfeeding important here? What do people believe about breastfeeding?

Some women here say breast milk alone is not enough for a baby to grow. Why is that?

What do people in the community believe about breastfeeding and HIV?

What do people in the community believe about sex and breastfeeding?

Breast milk is free. Why then do mothers choose to buy formula milk?

How important is formula feeding in this community? Why is it important for mothers to buy formula/why do mothers like to buy formula for their babies?

How easy is it to buy formula here? Is it easily available in the shops? Do mothers find it easy or difficult to prepare the formula?

What do you know about adding Nestum to the formula milk? Why are mothers doing this?

Who do you think is usually healthier; a baby getting only breast milk or a baby that gets both breast milk and formula milk?

How important is the size or weight of the baby? What do people say about a small baby and a big baby? What makes a baby to grow big?

What is important to mothers when deciding how to feed their babies?

What are the everyday challenges that mothers face when feeding their babies?

Appendix D

Zithulele informed consent form (English)

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Participant Information Leaflet and Consent Form

Feeding practices of mothers with infants younger than 6 months

PRINCIPAL INVESTIGATOR: Marguerite Marlow
CO-INVESTIGATOR: Prof S.A Kagee
ADDRESS: Psychology Department, Stellenbosch University
CONTACT NUMBERS:

Marguerite Marlow	082 448 3549 (cell)	
Prof S.A Kagee	(021) 808 3442 (office)	083 443 3002 (cell)

You are being invited to take part in a research project. Please take some time to read the information on this form, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you fully understand what this research is about and how you could be involved. Also, whether or not you choose to be involved in the study is completely up to you. No one is forcing you to take part. If you say no, this will not affect you negatively in any way whatsoever. You are also free to change your mind at any point, even if you do agree to take part in the beginning.
This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international declaration of Helsinki (October 2008), South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?
This study will take place in Khayelitsha in the Western Cape and at the Zithulele district hospital in the Eastern Cape. Mothers with infants younger than 6 months will be invited to take part in this study. We are interested to find out what values mothers place on breastfeeding and what influences you as a mother to choose to breastfeed or formula feed your baby.
The Canadian Institute of Health Research is paying for the research project.

How will we do this study?
You will be asked to attend an interview at a time that suits you, so that we can interview you for about an hour. A researcher will ask you questions about your experience and views of breastfeeding. We do not expect any correct answers and we are only interested in your opinions, feelings and beliefs. We would like to tape the interview so that we can easily refer back to your answers. The tapes will be safely locked away in an office at Stellenbosch University during the

study and will be destroyed once the project is finished. You will be told of any new relevant information that arises during the study.

Why have you been invited to participate?
We have asked you to be involved in this study because we would like to learn about your views of breastfeeding and formula feeding. We are interested to hear your opinions as they are important to us.

Will you benefit from taking part in this research?
There are no direct benefits to you but there may be benefits to your community if we can find ways to counsel and encourage mothers to feed their infants better so that they grow up healthy and strong.

Are there risks involved in your taking part in this research?
No harm will come to you through taking part in this study which involves you speaking to a researcher. If you become upset as a result of what is discussed in the interview, you can phone Marguerite Marlow at 082 448 3549 or Professor Ashraf Kagee at Stellenbosch University at 021 808 3442.

If you do not agree to take part, what alternatives do you have?
You do not have to take part in this project and you will not be affected in any way if you decide not to be involved. You can continue to attend the hospital and clinic as you usually do.

Who will have access to your information?
All your information will be stored safely and kept in confidence between the members of the research team. Information from the study will be examined by researchers at the University of Stellenbosch in South Africa and the University of Ottawa in Canada. If the study is published in a journal, all your information will remain confidential.
The people who are paying for this research, the study monitors and the Health Research Ethics Committee (HREC) members may need to look at all the study records but nobody will be able to identify you personally.

Will you be paid to take part in this study and are there any costs involved?
No, you will not be paid to take part in the study but your transport costs will be covered for each study visit and you will be given an airtime voucher to the value of R30 for your participation. There will be no costs involved for you, if you do take part.

Is there anything else you should know or do?

- You can contact Marguerite Marlow (082 448 3549) or Prof. Ashraf Kagee (021 808 3442) if you have any further queries or encounter any problems.
- You can contact the Health Research Ethics Committee at 021 938 9207 if you have concerns or complaints that have not been adequately addressed by your study coordinator.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I …….. agree to take part in a research study entitled **An exploration of the barriers and facilitators to exclusive breastfeeding practices among HIV-infected women with uninfected infants in South Africa**
I declare that:

- I have read or someone has read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised in any way.
- I may choose to leave the study at any time and will not be penalized or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study coordinator or researcher feels it is in my best interest, or if I do not follow the study plan, as agreed to.

Signed at *(place)*…… on *(date)* …….

…….. ……..
Signature of participant **Signature of witness**

Declaration by investigator

I *(name)* …… declare that:

- I explained the information in this document to ……
- I encouraged him/her to ask questions and took adequate time to answer them
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did/did not use an interpreter.

Signed at *(place)*…… on *(date)* …….

…….. ……..
Signature of investigator **Signature of witness**

Appendix E

Zithulele informed consent form (isiXhosa)

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IYUNIVESITHI YASESTELLENBOSCH

Iphetshana lesivumelwano somthathi-nxaxheba: ZITHULELE

Iindlela zoomama zokuncancisa iintsana ezingaphantsi kweenyanga ezi-6

UMPHANDI OYINTLOKO: Marguerite Marlow
UMPHANDI ONCEDISAYO: Prof S.A Kagee
IDILESI: Psychology Department, Stellenbosch University
IINOMBOLO ZOQHAGAMSHELWANO:

Marguerite Marlow	082 448 3549 (yeselula)
Njingalwazi S.A Kagee	(021) 808 3442 (ye-ofisi) 083 443 3002 (yeselula)

Uyamenywa ukuba uthathe inxaxheba kwProjekhthi yophando. Nceda uthathe ixesha lakho ufunde le nkcazelo ikule fomu, izakukuchazela banzi ngale projekhthi. Ukuba unombuzo malunga nayiphi na into ongayiqondi kakuhle ngale projekhthi nceda ubuze kubasebenzi besi sifundo. Kubalulekile kakhulu ukuba wazi ngokupheleleyo ukuba oluphando lungantoni na kwaye wena uzakubandanyeka njani na. Kwakhona, ukuvuma nokungavumi kwakho kuxhomekeke kuwe. Akukho mntu unokukunyanzela ukuba uthathe inxaxheba. Ukuba uyala oko akusayi kukuchaphazela nangayiphi na indlela. Ukwavumelekile ukuba ungatshintsha isigqibo sakho nangaliphi na ixesha, nokuba ubuvumile na ekuqaleni.

Esi sifundo siphunyezwe yikomiti yophando yezempilo eYunivesithi yaseStellenbosch yaye iyakuqhutywa ngokwemiqathango nezalathiso zesiBhengezo samaZwe ngamazwe seHelsinki (International declaration of Helsinki) (Okhthobha 2008), iziKhokelo zaseMzantsi Afrika zeZenzo ezilungileyo zoNyango kunye neziKhokelo ezaMkelekileyo zoPhando zeBhunga loPhando lwezoNyango (South African Guidelines for good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research).

Singantoni esi sifundo sophando?
Esi sifundo siyakwenziwa eKhayelitsha, eNtshona Koloni, nase sibhedlele sengingqi iZithulele, eMpuma Koloni. Oomama abanabantwana abasebancinci bazakumenywa ukuba bathathe inxaxheba kwesi sifundo. Sinomdla wokwazi imbono zomama malunga nokuncancisa umntwana ubisi lwebele kuphela, sive nokuba yintoni ekubangele ukuba umnike ubisi lwebele okanye

olusetotini umntwana wakho. Le projekhthi yophando ibhatelelwe liZiko loPhando lwezeMpilo laseCanada (Canadian Institute of Health Research).

Siza kusiqhuba jani esi sifundo? Uza kucelwa kuba uze kudliwano-ndlebe ngelo xesha lilungileyo kuwe, ukuze senze udliwano-ndlebe nawe kangangexesha eliyiyure. Umphandi uza kukubuza imibuzo malunga nezimvo zakho ngokuncancisa abantwana. Asilindelanga mpendulo zizizo, sinomdla kuphela kwizimvo, iimvakalelo kunye neenkolelo zakho. Singathanda ukulushicilela udliwano-ndlebe khon'ukuze sikwazi ukumamela lula iimpendulo zakho. Olu shicilelo luya kutshixelwa kwi-ofisi eyunivesithi yaseStellenbosch ngeli xesha lophando kwaye ziya kutshatyalaliswa ukugqitywa nje kwale projekhthi. Uyakwaziswa ngolwazi oluthe lwavela ngeli xesha lophando.

Kutheni umenyiwe ukuba uthathe inxaxheba nje?
Sikucele ukuba ube yinxalenye yesi sifundo kuba singathanda ukuva ngeembono zakho malunga nokuncancisa abantwana ubisi lwebele nolusetotini. Sinomdla wokuva ngezimvo zakho kuba zibalulekile kuthi.

Ungazuza nto na ngokuthatha kwakho inxaxheba?
Akukho nzuzo eza kuwe ngqo kodwa kungakho inzuzo enokufunyanwa yindawo ohlala kuyo, ukuba singafumana indlela yokuthetha sikhuthaze oomama ukuba bondle iintsana zabo ngendlela eyiyo ukuze bakhule besempilweni kwaye bomelele.
Ingaba kukho ubungozi na ngokuthatha kwakho inxaxheba kolu phando?

Akukho bungozi obunokuthi bubekho ngakuwe ngokuthatha kwakho inxaxheba kwesi sifundo, kubandakanya nokuthetha kwakho nomphandi. Ukuba kungakho into ekukhathazayo kwizinto ekuthethwa ngazo kudliwano-ndlebe, ungatsalela umnxeba uMarguerite Marlow kwezi nombolo 082 448 3549 okanye uNjingalwazi r Ashraf Kagee Yunivesithi yaseStellenbosch ku 021 808 3442.

Ukuba akuthandi ukuthatha inxaxheba zeziphi ezinye iindlela onazo?
Awunyanzelekanga ukuba uthathe inxaxheba kule projekhthi, kwaye awusayi kuchaphazeleka nangayiphi na indlela xa uthe akwafuna ukuzibandakanya. Ungaqhubeka uye ezibhedlele nase zikliniki ngendlela ofuna ngayo.

Ngubani oya kuthi avumeleke ukujonga iinkcukacha zakho?
Zonke iinkcukacha zakho ziya kugcinwa zikhuselekile kwaye ziyimfihlo kubasebenzi aba bophando. Iinkcukacha zesi sifundo ziya kuvavanywa ngabaphandi eYunivesithi yaseStellenbosch naseYunivesithi yase-Ottawa eCanada. Ukuba esi sifundo siye sapapashwa kumaphepha zonke iinkcukacha zakho ziya kuhlala ziyimfihlo.
Abantu abaxhasa olu phando ngemali abaniki ngqwalasela kuphando kwaye namalungu eKomiti yeeNdlela ezizizo zoPhando lwezeMpilo (Health Research Ethics Committee) (HREC) angathanda ukujonga zonke iinkcukacha zolu phando kodwa akukho namnye oya kwazi ukuba ezo ziinkcukacha zakho.

Ingaba uza kuhlawulwa na okanye ingaba kukho intlawulo efunekayo na ngokuthatha kwakho inxaxheba? Hayi, awuz'ukuhlawulwa ngokuthatha kwakho inxaxheba kwesi sifundo uza kufumana ivawutsha exabisa iirandi ezingama-30 yokuzithengela umoya njengombulelo kuwe. Akukho zindleko kuwe ngokuthatha kwakho inxaxheba kolu phando.

Ingaba ikhona enye into ofanelwe kukuyazi okanye kukuyenza?

- Ungatsalela umnxeba uMarguerite Marlow (082 448 3549) okanye uNjing. Ashraf Kagee (021 808 3442) ukuba ufuna ezinye iinkcazelo okanye uhlangabezana neengxaki.
- Ungaqhagamshelana neKomiti yeeNdlela ezizizo zoPhando lwezeMpilo (Health Research Ethics Committee) ku 021 938 9207 ukuba unenkxalabo okanye izikhalazo ezithe azacaciswa ngendlela eyiyo ngumphati wophando.
- Uza kufumana ikopi yale fomu yesivumelwano uzigcinele yona.

Isivumelwano somthathi-nxaxheba

Ngokutyikitya okulandelayo, Mna …….. ndiyavuma ukuthatha inxaxheba kwesi sifundo sophando esimalunga nokuncanciswa kweentsana ubisi lwebele kuphela eMzantsi Afrika.

Ndiyavuma ukuba:

- Ndiyifundile okanye ndiyifundelwe le ngcaciso nefomu yemvume, kwaye ibhalwe ngolwimi endilwaziyo noluqhelekileyo kum.
- Ndilifumene ithuba lokubuza imibuzo, yaye yonke imibuzo yam iphenduleke ngokonelisayo
- Ndiyazi ukuba ukuthatha inxaxheba kwesi sifundo akunyanzelekanga kwaye khange ndinyanzelwe nangaluphi na uhlobo.
- Ndinokucelwa ukuba mandiphume kwesi sifundo nangaliphi na ixesha, xa umphathi wesifundo okanye umphandi ekholelwa ekubeni yinto endilungeleyo leyo, okanye xa ndingalandeli imigaqo yesifundo njengoko besivumelene.

Ityikitywe *(Indawo)*…… nge *(umhla)* ……

…….. ……..

Utyikityo lomthathi-nxaxheba **Utyikityo lwengqina**

Inkcazelo Yomphandi

Mna *(igama)* …… Ndiyavuma ukuba:

- Ndizichazile inkcukacha ezikolu xwebhu ku…….
- Ndimkhuthazile ukuba abuze imibuzo, ndathatha ithuba elaneleyo ukuyiphendula.
- Ndanelisekile ukuba uyiqonda ngokwaneleyo imiba yophando, njengoko kuchaziwe ngasentla.
- Khange ndisebenzise toliki.

Ityikitywe e *(indawo)*…… nge *(umhla)* ……

…….. ……..

Utyikityo lomphandi **Utyikityo lwengqina**

Appendix F

Khayelitsha informed consent form (English)

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STELLENBOSCH UNIVERSITY

Participant Information Leaflet and Consent Form

Feeding practices of mothers with infants younger than 6 months

PRINCIPAL INVESTIGATOR: Marguerite Marlow
CO-INVESTIGATOR: Prof S.A Kagee
ADDRESS: Psychology Department, Stellenbosch University
CONTACT NUMBERS:

Marguerite Marlow	082 448 3549 (cell)	
Prof S.A Kagee	(021) 808 3442 (office)	083 443 3002 (cell)

You are being invited to take part in a research project. Please take some time to read the information on this form, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you fully understand what this research is about and how you could be involved. Also, whether or not you choose to be involved in the study is completely up to you. No one is forcing you to take part. If you say no, this will not affect you negatively in any way whatsoever. You are also free to change your mind at any point, even if you do agree to take part in the beginning.
This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international declaration of Helsinki (October 2008), South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?
This study will take place in Khayelitsha in the Western Cape and at the Zithulele district hospital in the Eastern Cape. Mothers with infants younger than 6 months will be invited to take part in this study. We are interested to find out what values mothers place on breastfeeding and what influences you as a mother to choose to breastfeed or formula feed your baby.
The Canadian Institute of Health Research is paying for the research project.

How will we do this study?
You will be asked to attend an interview at a time that suits you, so that we can interview you for about an hour. A researcher will ask you questions about your experience and views of breastfeeding. We do not expect any correct answers and we are only interested in your opinions, feelings and beliefs. We would like to tape the interview so that we can easily refer back to your answers. The tapes will be safely locked away in an office at Stellenbosch University during the

study and will be destroyed once the project is finished. You will be told of any new relevant information that arises during the study.

Why have you been invited to participate?
We have asked you to be involved in this study because we would like to learn about your views of breastfeeding and formula feeding. We are interested to hear your opinions as they are important to us.

Will you benefit from taking part in this research?
There are no direct benefits to you but there may be benefits to your community if we can find ways to counsel and encourage mothers to feed their infants better so that they grow up healthy and strong.

Are there risks involved in your taking part in this research?
No harm will come to you through taking part in this study which involves you speaking to a researcher. If you become upset as a result of what is discussed in the interview, you can phone Marguerite Marlow at 082 448 3549 or Professor Ashraf Kagee at Stellenbosch University at 021 808 3442.

If you do not agree to take part, what alternatives do you have?
You do not have to take part in this project and you will not be affected in any way if you decide not to be involved. You can continue to attend the hospital and clinic as you usually do.

Who will have access to your information?
All your information will be stored safely and kept in confidence between the members of the research team. Information from the study will be examined by researchers at the University of Stellenbosch in South Africa and the University of Ottawa in Canada. If the study is published in a journal, all your information will remain confidential.
The people who are paying for this research, the study monitors and the Health Research Ethics Committee (HREC) members may need to look at all the study records but nobody will be able to identify you personally.

Will you be paid to take part in this study and are there any costs involved?
No, you will not be paid to take part in the study but your transport costs will be covered for each study visit and you will be given a food voucher to the value of R100 for your participation. There will be no costs involved for you, if you do take part.

Is there anything else you should know or do?

- You can contact Marguerite Marlow (082 448 3549) or Prof. Ashraf Kagee (021 808 3442) if you have any further queries or encounter any problems.
- You can contact the Health Research Ethics Committee at 021 938 9207 if you have concerns or complaints that have not been adequately addressed by your study coordinator.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I …….. agree to take part in a research study entitled **An exploration of the barriers and facilitators to exclusive breastfeeding practices among HIV-infected women with uninfected infants in South Africa**
I declare that:

- I have read or someone has read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised in any way.
- I may choose to leave the study at any time and will not be penalized or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study coordinator or researcher feels it is in my best interest, or if I do not follow the study plan, as agreed to.

Signed at *(place)*…… on *(date)* …….

…….. ……..
Signature of participant **Signature of witness**

Declaration by investigator

I *(name)* …… declare that:

- I explained the information in this document to ……
- I encouraged him/her to ask questions and took adequate time to answer them
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did/did not use an interpreter.

Signed at *(place)*…… on *(date)* …….

…….. ……..
Signature of investigator **Signature of witness**

Appendix G

Khayelitsha informed consent form (isiXhosa)

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IYUNIVESITHI YASESTELLENBOSCH

Iphetshana lesivumelwano somthathi-nxaxheba: KHAYELITSHA

Iindlela zoomama zokuncancisa iintsana ezingaphantsi kweenyanga ezi-6

UMPHANDI OYINTLOKO: Marguerite Marlow
UMPHANDI ONCEDISAYO: Prof S.A Kagee
IDILESI: Psychology Department, Stellenbosch University
IINOMBOLO ZOQHAGAMSHELWANO:

Marguerite Marlow	082 448 3549 (yeselula)
Njingalwazi S.A Kagee	(021) 808 3442 (ye-ofisi) 083 443 3002 (yeselula)

Uyamenywa ukuba uthathe inxaxheba kwProjekhthi yophando. Nceda uthathe ixesha lakho ufunde le nkcazelo ikule fomu, izakukuchazela banzi ngale projekhthi. Ukuba unombuzo malunga nayiphi na into ongayiqondi kakuhle ngale projekhthi nceda ubuze kubasebenzi besi sifundo. Kubalulekile kakhulu ukuba wazi ngokupheleleyo ukuba oluphando lungantoni na kwaye wena uzakubandanyeka njani na. Kwakhona, ukuvuma nokungavumi kwakho kuxhomekeke kuwe. Akukho mntu unokukunyanzela ukuba uthathe inxaxheba. Ukuba uyala oko akusayi kukuchaphazela nangayiphi na indlela. Ukwavumelekile ukuba ungatshintsha isigqibo sakho nangaliphi na ixesha, nokuba ubuvumile na ekuqaleni.

Esi sifundo siphunyezwe yikomiti yophando yezempilo eYunivesithi yaseStellenbosch yaye iyakuqhutywa ngokwemiqathango nezalathiso zesiBhengezo samaZwe ngamazwe seHelsinki (International declaration of Helsinki) (Okhthobha 2008), iziKhokelo zaseMzantsi Afrika zeZenzo ezilungileyo zoNyango kunye neziKhokelo ezaMkelekileyo zoPhando zeBhunga loPhando lwezoNyango (South African Guidelines for good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research).

Singantoni esi sifundo sophando?
Esi sifundo siyakwenziwa eKhayelitsha, eNtshona Koloni, nase sibhedlele sengingqi iZithulele, eMpuma Koloni. Oomama abanabantwana abasebancinci bazakumenywa ukuba bathathe inxaxheba kwesi sifundo. Sinomdla wokwazi imbono zomama malunga nokuncancisa umntwana ubisi lwebele kuphela, sive nokuba yintoni ekubangele ukuba umnike ubisi lwebele okanye olusetotini umntwana wakho.
Le projekhthi yophando ibhatelelwe liZiko loPhando lwezeMpilo laseCanada (Canadian Institute of Health Research).

Siza kusiqhuba jani esi sifundo? Uza kucelwa kuba uze kudliwano-ndlebe ngelo xesha lilungileyo kuwe, ukuze senze udliwano-ndlebe nawe kangangexesha eliyiyure. Umphandi uza kukubuza imibuzo malunga nezimvo zakho ngokuncancisa abantwana. Asilindelanga mpendulo zizizo,

sinomdla kuphela kwizimvo, iimvakalelo kunye neenkolelo zakho. Singathanda ukulushicilela udliwano-ndlebe khon'ukuze sikwazi ukumamela lula iimpendulo zakho. Olu shicilelo luya kutshixelwa kwi-ofisi eyunivesithi yaseStellenbosch ngeli xesha lophando kwaye ziya kutshatyalaliswa ukugqitywa nje kwale projekhthi. Uyakwaziswa ngolwazi oluthe lwavela ngeli xesha lophando.

Kutheni umenyiwe ukuba uthathe inxaxheba nje?
Sikucele ukuba ube yinxalenye yesi sifundo kuba singathanda ukuva ngeembono zakho malunga nokuncancisa abantwana ubisi lwebele nolusetotini. Sinomdla wokuva ngezimvo zakho kuba zibalulekile kuthi.

Ungazuza nto na ngokuthatha kwakho inxaxheba?
Akukho nzuzo eza kuwe ngqo kodwa kungakho inzuzo enokufunyanwa yindawo ohlala kuyo, ukuba singafumana indlela yokuthetha sikhuthaze oomama ukuba bondle iintsana zabo ngendlela eyiyo ukuze bakhule besempilweni kwaye bomelele.

Ingaba kukho ubungozi na ngokuthatha kwakho inxaxheba kolu phando?
Akukho bungozi obunokuthi bubekho ngakuwe ngokuthatha kwakho inxaxheba kwesi sifundo, kubandakanya nokuthetha kwakho nomphandi. Ukuba kungakho into ekukhathazayo kwizinto ekuthethwa ngazo kudliwano-ndlebe, ungatsalela umnxeba uMarguerite Marlow kwezi nombolo 082 448 3549 okanye uNjingalwazi r Ashraf Kagee Yunivesithi yaseStellenbosch ku 021 808 3442.

Ukuba akuthandi ukuthatha inxaxheba zeziphi ezinye iindlela onazo?
Awunyanzelekanga ukuba uthathe inxaxheba kule projekhthi, kwaye awusayi kuchaphazeleka nangayiphi na indlela xa uthe akwafuna ukuzibandakanya. Ungaqhubeka uye ezibhedlele nase zikliniki ngendlela ofuna ngayo.

Ngubani oya kuthi avumeleke ukujonga iinkcukacha zakho?
Zonke iinkcukacha zakho ziya kugcinwa zikhuselekile kwaye ziyimfihlo kubasebenzi aba bophando. Iinkcukacha zesi sifundo ziya kuvavanywa ngabaphandi eYunivesithi yaseStellenbosch naseYunivesithi yase-Ottawa eCanada. Ukuba esi sifundo siye sapapashwa kumaphepha zonke iinkcukacha zakho ziya kuhlala ziyimfihlo.
Abantu abaxhasa olu phando ngemali abaniki ngqwalasela kuphando kwaye namalungu eKomiti yeeNdlela ezizizo zoPhando lwezeMpilo (Health Research Ethics Committee) (HREC) angathanda ukujonga zonke iinkcukacha zolu phando kodwa akukho namnye oya kwazi ukuba ezo ziinkcukacha zakho.

Ingaba uza kuhlawulwa na okanye ingaba kukho intlawulo efunekayo na ngokuthatha kwakho inxaxheba?
Hayi, awuz'ukubhatalwa ngokuthatha kwakho inxaxheba kwesi sifundo kodwa iindleko zakho zokuza kwindawo uphando oluqhutyelwa kuyo ziza kubhatalelwa, kwaye uya kufumana ivawutsha exabisa i-R100 ngokuthatha kwakho inxaxheba. Akukho ntlawulo uyakuthi uyenze ngokuthatha kwakho inxaxheba.

Ingaba ikhona enye into ofanelwe kukuyazi okanye kukuyenza?
- Ungatsalela umnxeba uMarguerite Marlow (082 448 3549) okanye uNjing. Ashraf Kagee (021 808 3442) ukuba ufuna ezinye iinkcazelo okanye uhlangabezana neengxaki.
- Ungaqhagamshelana neKomiti yeeNdlela ezizizo zoPhando lwezeMpilo (Health Research Ethics Committee) ku 021 938 9207 ukuba unenkxalabo okanye izikhalazo ezithe azacaciswa ngendlela eyiyo ngumphati wophando.

- Uza kufumana ikopi yale fomu yesivumelwano uzigcinele yona.

Isivumelwano somthathi-nxaxheba

Ngokutyikitya okulandelayo, Mna …….. ndiyavuma ukuthatha inxaxheba kwesi sifundo sophando esimalunga nokuncanciswa kweentsana ubisi lwebele kuphela eMzantsi Afrika.
Ndiyavuma ukuba:

- Ndiyifundile okanye ndiyifundelwe le ngcaciso nefomu yemvume, kwaye ibhalwe ngolwimi endilwaziyo noluqhelekileyo kum.
- Ndilifumene ithuba lokubuza imibuzo, yaye yonke imibuzo yam iphenduleke ngokonelisayo
- Ndiyazi ukuba ukuthatha inxaxheba kwesi sifundo akunyanzelekanga kwaye khange ndinyanzelwe nangaluphi na uhlobo.
- Ndinokucelwa ukuba mandiphume kwesi sifundo nangaliphi na ixesha, xa umphathi wesifundo okanye umphandi ekholelwa ekubeni yinto endilungeleyo leyo, okanye xa ndingalandeli imigaqo yesifundo njengoko besivumelene.

Ityikitywe *(Indawo)*…… nge *(umhla)* …….

…….. ……..
Utyikityo lomthathi-nxaxheba **Utyikityo lwengqina**

Inkcazelo Yomphandi

Mna *(igama)* …… Ndiyavuma ukuba:

- Ndizichazile inkcukacha ezikolu xwebhu ku…….
- Ndimkhuthazile ukuba abuze imibuzo, ndathatha ithuba elaneleyo ukuyiphendula.
- Ndanelisekile ukuba uyiqonda ngokwaneleyo imiba yophando, njengoko kuchaziwe ngasentla.
- Khange ndisebenzise toliki.

Ityikitywe e *(indawo)*…… nge *(umhla)* …….

…….. ……..
Utyikityo lomphandi **Utyikityo lwengqina**

Appendix H
Comparative edit of translated consent forms (certificate)

TAALSENTRUM
LANGUAGE CENTRE
IZIKO LEELWIMI

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

28 August 2013

Ms M Marlow
Department of Psychology
Stellenbosch University
Private Bag X1
Matieland
7602

Dear Ms Marlow

The Stellenbosch University Language Centre hereby confirms that we completed a comparative edit of your participant information leaflet and consent forms for the following study: Feeding practices of mothers with infants younger than 6 months. The Xhosa translations (as listed below), which you supplied, were compared to the English source texts and returned to you on 27 August 2013 with all editing changes visible in the track changes function of MS Word:

ICF Khayelitsha Xhosa

ICF Zith Xhosa

Please contact me if you have any questions.

Regards

p.p.

Alta van Rensburg

Head: Language Service

Stellenbosch University Language Centre

Tel: 021 808 2231

Fax: 021 808 2863

E-mail: avrens@sun.ac.za

Appendix I

Ethical approval from the Human Research Ethics Committee (2012-2013)

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Approval Notice
New Application

06-Sep-2012
Kagee, Shaheen S

Ethics Reference #: N12/05/021

Title: **An exploration of the barriers and facilitators to adherence to exclusive breastfeeding practices among HIV-infected women with uninfected infants in South Africa and Nigeria: Protocol No 255071CIHR/IRSC**

Dear Professor Shaheen Kagee,

The **New Application** received on **07-May-2012**, was reviewed by members of **Health Research Ethics Committee 1** via Expedited review procedures on **06-Sep-2012** and was approved.
Please note the following information about your approved research protocol:

Protocol Approval Period: **06-Sep-2012 -06-Sep-2013**

Please remember to use your **protocol number** (**N12/05/021**) on any documents or correspondence with the REC concerning your research protocol.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:
Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired.
The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number projects may be selected randomly for an external audit.
Translation of the consent document in the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.
For standard REC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further help, please contact the REC office at 0219389657.

Included Documents:
Declaration
Synopsis
Application
Track Changes
Protocol
Track Changes
Appendix
CV
Letter of Response
Consent

Appendix J

Ethical approval from the Human Research Ethics Committee (2013-2014)

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Ethics Letter

24-Oct-2013

Ethics Reference #: N12/05/021
Title: An exploration of the barriers and facilitators to adherence to exclusive breastfeeding practices among HIV-infected women with uninfected infants in South Africa and Nigeria: Protocol No 255071CIHR/IRSC

Dear Professor Shaheen Kagee,

At a meeting of the Health Research Ethics Committee that was held on 16 October 2013, the progress report for the abovementioned project has been approved and the study has been granted an extension for a period of one year from this date.

Please remember to submit progress reports in good time for annual renewal in the standard HREC format.

Approval Date: 16 October 2013 Expiry Date: 16 October 2014

If you have any queries or need further help, please contact the REC Office 0219389207.

Sincerely,

REC Coordinator
Mertrude Davids
Health Research Ethics Committee 2

Appendix K

Codebook

Abbreviations:

BF:	Breastfeeding
CF:	Complimentary Feeding
Comm:	Community
CommBel:	Community Belief
CommPrac:	Community Practice
Fe:	Feeding
FF:	Formula Feeding
EC:	Eastern Cape
Gen:	General
HCW:	Health Care Worker
IF:	Infant Feeding
MatBeh:	Maternal Behaviour
MF:	Mix Feeding
NegExp:	Negative Experience
OL:	Other Liquids
OV:	Own View
PosExp:	Positive Experience
TradMed:	Traditional Medicine
TradPrac:	Traditional Practice
V/P:	View/Preference
WC:	Western Cape

CODEBOOK		
Category: FEEDING PRACTICE		
CurrentlyFeeding_ BF/FF/CF/MF/OL	Mother provides a description of the fluids/foods that she is feeding her baby at this point in the baby's life	*"I am breastfeeding but this month I started feeding my child Lactogen formula milk, but I don't mix it I prepare it as it is"*
FeProcedure_ BF/FF/CF/MF/OL	Mother provides a description of how she feeds her baby the fluids/foods	*"I feed her one bottle around 19:00 and when she falls asleep maybe around 21:00 she wakes up I won't feed the remaining formula milk from the first bottle but instead use the second clean bottle"*
FePlan_Time	Mother identifies at what time she decided on how she would feed her baby	*"...while I was pregnant because I was asked at the clinic and they only supply formula milk to people who have a problem with breastfeeding so I did not have a problem"*
FePlan_Future	Mother identifies what and how she plans to feed her baby in the future	*"I am still breastfeeding and the moment but I think at a later stage I will feed soup and mashed potatoes"*
BFStopped	Mother reports that she is no longer breastfeeding or that she stopped breastfeeding	*"...my child did not like breast milk and I tried to breastfeed so I had to take her to the clinic, even when I was still at hospital I was forcing her but I finally decided to stop breastfeeding"*
FFStopped	Mother reports that she is no longer formula feeding or that she stopped formula feeding	*"I stopped giving it as it causes chest problems for my baby"*
PC_Same	Mother identifies whether the way she is feeding this particular infant is consistent with the way she fed her older children	*"I always breastfeed until six months and only after six I introduce the baby to other foods"*
PC_Different	Mother identifies whether the way she is feeding this particular infant differs from the way she fed her older children	*"...I use to breastfeed them for 3 months and on the 4 month I would introduce formula milk"*
Category: INFANT AND FEEDING **Subcategories:** Growth; Health; Size/Weight; Feeding Reaction		
GROWTH, HEALTH, WEIGHT		
Infant_Growth_ BF/FF/CF/MF	Perceived connection between a specific feeding practice/fluid/food and the infant's growth	*"Yes I do agree because as some stage my baby lost weight and she started feeding her food and when I told her what the nurses advised us she did not listen and kept on feeding her food so I noticed that my baby is gaining weight, so I strongly agree with her"*

Infant_Health_BF/FF/CF/MF	Perceived connection between a specific feeding practice/fluid/food and the infant's health	*"...what encouraged me to keep on breastfeeding is that I can see breastfed baby looks very healthy unlike the bottle fed, so I enjoy breastfeeding"*
Infant_Weight/Size_BF/FF/CF/MF	Perceived connection between a specific feeding practice/fluid/food and the infant's weight or size	*"...because my baby weighs more now than when she was born but when I feed her Pelagon she gained weight, I don't feed anything except Pelagon"*
HIV+_Infant	Mother raises the issue of HIV as it holds bearing on the infant	*"I don't feel good at all I always think that I might infect the baby if I had a choice I would feed formula milk"*
REACTION		
FeReaction_BF	Infant's reaction to receiving breast milk	*"the baby would cry when I stop breastfeeding and would still want more sooner"*
FeReaction_FF	Infant's reaction to receiving formula milk	*"my child likes to cry a lot and does not get enough from the breast milk so ever since I started feeding formula milk he does not cry anymore after feeding him"*
FeReaction_CF	Infant's reaction to receiving complimentary foods	*"He seems to be satisfied when I feed him both the bottle and breast milk and he stopped crying"*
FeReaction_MF	Infant's reaction to receiving a combination of feeds (breast milk, formula and/or complimentary foods)	*You can tell when the baby is full because she licks her fingers and will keep on fiddling with your breasts but when you feed her porridge she does remains calm"*
FeReaction_OL	Infant's reaction to receiving liquids other than breast milk or formula milk (water, medicine, juice, tea, cow's milk)	*"I believe Rooibos makes you fall asleep so I believe it will make the baby fall asleep"*
Category: MOTHER AND FEEDING **Subcategories:** Views, Beliefs, Experiences (Infant Feeding; HIV; Weight; Sex; Traditional Practices), Personal Factors		
VIEWS, BELIEFS, EXPERIENCES		
ReasonFor_BF/FF/CF/MF	Mother provides a reason for choosing a specific feeding practice	*"I realized the baby was not getting enough and she showed interests when I eat so that is why I decided to introduce other foods apart from breastfeeding"*
Challenge_BF/FF/CF/MF	Mother identifies a challenge/difficulty that she associates with a specific feeding practice	*"When my child is not getting enough food I do worry about money for formula milk"*
Challenge_IF_HIV	Mother identifies a challenge/difficulty that she associates with HIV and infant feeding	*"I cannot trust that my child won't be infected so I am sometimes concerned"*
PosExp_IF	Mother describes a positive experience that she associated with a particular feeding type	*"It is every mother pride to breastfeed her baby and you bond with your child and as a result there's a bond between me and my 24 year old son. He would go and*

		play outside with other children but still when he comes back he would tell me to sit down and breastfeed him"
NegExp_IF	Mother describes a negative experience that she had associated with a particular feeding type	*"This one became hard and sore and when I tried to express something funny came out of my breast and people told me that maybe the baby burped on the breast and afterwards it shrinked and I went to the clinic and the nurses asked me whether I want to continue breastfeeding or stop and I decided to stop breastfeeding"*
BM_Enough	Mother's perception about the sufficiency of breast milk	*"I could see that my child was getting enough and satisfied with breast milk"*
BM_NotEnough	Mother's perception about the insufficiency of breast milk	*"I mean that the baby does not get enough after putting him or her on both breasts and still cried to me that was the sign I was not producing enough breast milk and my breasts are always not full"*
BM_Supply	Mother's perception about the sufficiency/insufficiency of her milk production	*"Infacare is the only thing I can feed him and also when I am not producing enough breast milk I feed him Infacare"*
FF_Supply	The situation of formula milk supplies	*"I do worry that may be when I start mixing formula with Nestum maybe that will cost a lot of money, because the formula milk sometimes gets finished before the end of the month so that makes me wonder whether I will I afford when I have to buy Nestum too"*
FF_NotEnough	Mother's perception about the insufficiency of formula milk	*"I chose to feed my child the way I do because he was not getting enough of the breast milk and formula milk so I mixed it with Nestum"*
FeComparison	Mother compares different types of feeding	*"It is different as you immediately pick that up when you are breastfeeding whereas when you are only bottle feeding it is difficult to notice"*
Fe_Public	Experience/view on feeding in public places	*"I don't care even if I am at Woolworths I just look around for a chair where I can sit down and breastfeed my child"*
OV_BF/FF/CF/MF	Mother expresses her own view/opinion on a type of feeding/food/fluid	*"When you breastfeed you bond with your child and when your baby is not feeling well you easily detect that when the baby refuses to latch. Breast milk is the best because it contains nutrients and vitamins"*
OV_HIV_BF	Mother expresses her own view/opinion on the subject of HIV and breastfeeding	*"If you don't breastfeed people assume that you are HIV positive but irrespective of your HIV status mothers can now breastfeed"*
OV_HIV_FF	Mother expresses her own view/opinion on the subject of HIV and formula feeding	*"If I feed formula I would be sure that my baby would not be infected If you mix breast milk and formula milk that increases the chances of infecting your child"*

OV_ InfantSize/Weight	Mother expresses her own view/opinion on the weight or size of the infant (or infants in general)	*"...those who are small in size sometimes it is because of how you look after your child and also being sexually active without using any protection"*
OV_Sex_BF	Mother expresses her own view/opinion on the subject of sex and breastfeeding	*"I don't believe that breast milk is good for the child although I am not the doctor but I always encourage mothers if they want to engage into sex then they should stop breastfeeding and introduce milk formula and solid food"*
OV_Sex_ EffectInfant	Mother expresses her own view/opinion on the effect that sex may have on the infant	*"...one can see the difference between my child and a child whose mother is sexually active and the weight differs a lot even though they can be of the same age the other will be underweight whereas mine will have the normal weight"*
OV_Sex_NoEffect	Mother expresses her own view/opinion on the lack of effect that sex has on the infant	*"These are 2 different parts of your body, your breast is up here and your sex organ is down there so I don't see any reason why you one cannot engage in sex"*
OV_TradHeal	Mother expresses her own view/opinion on the cultural significance of traditional healing or medicine	*"I am very scared to take my baby for such things as I recently read in the newspapers of someone who took her baby to a woman for wind medicine and this woman lifted the bay with the baby's head facing down and the baby died instantly so I don't believe in such things"*
OV_Convergent*	Where mother's own view is in accordance with an external belief/practice/idea	*"Because what they advise me to feed the baby is exactly how I intended to feed my baby"*
OV_Divergent*	Where mother's own view is in conflict with an external belief/practice/idea	*"Those who feed their babies formula say it is good but I don't believe so because it is easy for them to leave their babies in the care of young children whereas you always take your child with you wherever you go if you are breastfeeding"*
PERSONAL FACTORS		
PersonalFactor_ BF/FF/CF/MF	Mother expresses how a specific feeding practice affects her on a personal level	*"...you completely forget about yourself and don't buy anything that you need because you are constantly thinking about the child's formula milk"*
Infant_Mother Relationship	Mother provides a description/experience/opinion on the relationship between a mother and an infant (her own or in general terms)	*"I decided to breastfeed my child because I wanted to give and show all the love the baby needs, and when you are breastfeeding you always think of your child when you go somewhere unlike someone who is bottle feeding"*
Challenges_ Motherhood	Mother identifies/experiences a challenge or difficulty associated with the responsibility of being a mother	*"...when you come home every day you are physical and emotional drained to spend time with your child"*

Challenges_ FirstTimeMother	Mother identifies/experiences a challenge or difficulty associated with first-time motherhood	*"I did not know anything about raising a child so I was surprised that you can breastfed a child for 6 months and I was too young and had nobody to guide me"*
MotherFoodIntake	Mother's own food intake and its effect on infant feeding	*"I think that I have to eat healthy in order to produce breast milk but there are days that I go without food and for some months we don't get enough food but if I eat a lot of porridge that helps me to produce more breast milk?"*
MotherHealth_ BF	Mother establishes a connection between her health status and that of infant	*"Obviously when I am sick the breast milk that I feed the baby will make the baby sick also"*
MotherKnows Best	Mother regards her own view/understanding/choice as superior	*"Some say it is right and some say I am starving the child but I know what is right for my child"*
MotherResponsib	The role of infant feeding on the mother's sense of responsibility	*"...because you are only breastfeeding and so you cannot leave your child behind and wherever you go you have to take your child with you and your child is not used to other people"*
Stress*	Mother expresses her distress or anxiety on a subject	*"I stress a lot I can't even eat if my child does not have formula milk"*
Uncertainty*	Mother experiences uncertainty about a subject	*"I never asked why and until now I do not know why they add Nestum, I did not know how much Nestum should I mix with formula milk"*
Don'tKnow*	Mother expresses her lack of knowledge on a subject	*"I really don't know anything about that maybe you can also explain this to me"*
Confusion*	Mother experiences confusion in relation to a subject	*"I did not know before I was advised on how I would feed my baby but I use to think and wonder as to how I will feed my child, actually I was confused"*
Category: INTERPERSONAL **Subcategories:** Advice; Input; Influence, Support, Disclosure, Pressure		
ADVICE		
AG_IF	Advice offered by the mother herself to other mothers on the subject of infant feeding	*"...they don't have a problem and I also advised my other sister to breastfeed only"*
AR_IF_Comm/ Fam/ HCW/Partner	Advice or information received on the subject of infant feeding from a community member, family member, health care staff member or the mother's partner	*"My mother told me that if you breastfeed your child will grow well and become very healthy and if you breastfeed while you are sick you will infect your child"*

AR_HIV_Comm/Fam/HCW/Partner	Advice or information received on the subject of HIV from a community member, family member, health care staff member or the mother's partner	*"The nurses informed us that one can breastfeed irrespective of her HIV status and so I was asked how do I intend to feed my baby and I told them that I will breastfeed"*
AR_Sex_Comm/Fam/HCW/Partner	Advice or information received on the subject of sex from a family member, community member, health care staff member or the mother's partner	*"...according to my mother's advice you cannot engage in sex while you are still breastfeeding because your baby will have diarrhoea"*
INPUT		
InputR_IF (BF/FF/CF/MF/OL)	Comments, questions or opinion received from others on the way that the mother feeds her infant	*"...most of my friends prefer milk formula and discourage me on breastfeeding, they tell me I act like an old woman and breastfeeding will make me age soon because we are living in the modern time and most mothers are feeding their babies the formula milk"*
InputR_Infant	Comments, questions or opinion received from others about the infant (infant characteristics such as weight, temperament, health)	*"...they say my child will be malnourished and won't grow well but the strange thing is wherever I go with my child people ask me what do I feed my child and I tell them that I am breastfeeding only and they ask me why was the previous one was light in weight and I tell them that I was mixing formula and breast milk"*
InputR_HIV	Comments, questions or opinion received from others on the subject of HIV	*"...she came to my house and found me breastfeeding she asked me why and I told her that one can breastfeed irrespective of your HIV status and she went around spreading rumours that I am breasting whereas I am HIV positive"*
IF_V/P_Comm	Community member(s) view/preference on a specific way of feeding or the mother's chosen feeding practice	*"I did not find it difficult although the elders were concerned that the baby will not get enough of the breast milk, I explained to them that the baby will get enough"*
IF_V/P_Family	Family member's view/preference on a specific way of feeding or the mother's chosen feeding practice	*"...she really does not want me to feed the milk formula but I am the one who insists on introducing the milk formula, I want to try to introduce milk formula but my mother insists that I should breastfeed and only give food when the baby is older"*
IF_V/P_HCW	Health care worker's view on a specific way of feeding or the mother's chosen feeding practice	*"...they asked me which formula milk do I feed my child and I told them it is Pelagon and they told me that Pelagon is equivalent to breast milk so they don't see any reason why I should breastfeed and formula feed otherwise I am over feeding my baby and advise me to change the formula and not feed him the Pelagon but they did not approve mix feeding"*
IF_V/P_Partner	Partner's view/preference on a specific way of feeding or the mother's chosen feeding practice	*"We disagreed on breastfeeding as he is concerned that I will infect the baby with virus and I explain to him we were advised at the clinic to breastfeed..."*

INFLUENCE		
Influence_IF_Comm	The influence of community members or community practice on the mother's feeding decision and practice	*"...I usually see and learn from other people and do as others, I was told to breastfeed 6 months but when the baby started crying I decided against what I was advised"*
Influence_IF_Family	The influence of the family on the mother's feeding decision and practice	*"...it feels like she is the mother not the grandmother as she cares more about her and looks after her and she guides and coaches me about raising the child"*
Influence_IF_HCW	The influence of health care workers (doctors, nurses, community health workers) on the mother's feeding decision and practice	*"Before I use to think she was not getting enough but since it was explained to us at the clinic I now understand that the baby can get enough from breast milk as it contains everything and I don't have to give her water as she is growing well"*
Influence_IF_Partner	The influence of the mother's partner on her feeding decision and practice	*"...he sometimes asks me if whether I did breastfeed the baby and he prefers that I should breastfeed and is not prepared to buy formula milk"*
Influence_Infant (preference)	The influence that the infant's reaction to or preference for a specific fluid or food hold over the mother's feeding decision	*"...I realised that my baby does not want breast milk even when I expressed milk so I decided to stop breastfeeding"*
NoInfluence*	Interactions with family/community/health care worker/partner showed no influence over feeding choice	*"They advise us on the best ways to feed our babies but I decided against their advice as my baby was not getting enough from breast milk..."*
ShowedInfluence*	Interactions with family/community/health care worker/partner showed influence over feeding choice	Interviewer: "*Is there any reason that you thought you must feed your child formula milk?"* M11_ZIT: "*Because in the community when I sometimes visit where there is a baby I can see even if the mother is breastfeeding but there is always formula milk in almost every household"*
SUPPORT		
NoSupport	Lack of perceived or actual support	*"He is not even involved in the child's life, he does not even show any interest in the child's life, so I gave up on him. So he has not even seen the child, I also stopped calling him because he does not return my calls..."*
Sup_FacilityB_IF	Perceived or actual facility-based support in terms of infant feeding	*"I get formula free from the clinic"*
Sup_FacilityB_HIV	Perceived or actual facility-based support in terms of HIV	*"I was afraid in the beginning but when I found about my sister's status I was also motivated and encouraged that I was not the only one who is HIV so now I belong to an HIV club at the clinic."*

Sup_Social_Comm	Perceived or actual social support in terms of infant feeding from the community	*"...and people also in the community recommend breast milk and they say my baby will grow fast"*
Sup_Social_Family	Perceived or actual social support in terms of infant feeding from family	*"...some people advice me to stop breastfeeding and my aunt also advised me to stop breastfeeding but my mother supports and encourages me to breastfeed as she is still breastfeeding my 2 year old sister, so my mother believes in breastfeeding"*
Sup_Social_Father of Infant	Perceived or actual social support in terms of infant feeding from the father of the infant	*"When I am busy with something he is there to assist me with the baby, when I am preparing food for the baby he holds him meanwhile I am busy, when I have to go somewhere just like now he had to clean up as I was running out of time"*
Sup_Fin/Mat_Family	Perceived or actual material or financial support in terms of infant feeding from the family	*"My sister gets worried when the baby's food is finished and she sometimes helps me and organise money for formula and my partner provides me with money for formula milk and my sister in law also supports me"*
Sup_Fin/Mat_Father of Infant	Perceived or actual material or financial support in terms of infant feeding from the father of the infant	*"As the father of the baby is not around he supports the child by depositing money for formula milk and disposable nappies"*
DISCLOSURE		
HIV+_discl_Family	Mother indicates that she has disclosed her HIV+ status to her family	*"...they do support me and they are aware that I am on ARV treatment"*
HIV+_discl_Comm	Mother indicates that she has disclosed her HIV+ status to someone in the community	*"...I was not the only one who is HIV positive and whenever one talks about his or her HIV status I also freely talk about my HIV status without any fear. So now I belong to an HIV club at the clinic because I honour my appointments"*
HIV+_discl_Partner	Mother indicates that she has disclosed her HIV+ status to her partner	*"Yes he asked me when I came back from the clinic with the results whether I was told anything and I could see that he was aware or he deliberately infected me with HIV and the only thing he told me was that we will be fine"*
HIV+_undiscl	Mother indicates that she has not disclosed her HIV+ status	*"...I chose not to breastfeed for the reason that I intended to go back to work after 3 months which means that I have to leave my baby with someone else who does not understand why I am not breastfeeding my child and that will compel me to disclose my status whereas I am not ready to"*
PRESSURE		
Pressure_Comm	Mother identifies or experiences pressure from the community on infant feeding	*"There is pressure on us as mothers as we get a lot of people to advice on what type formula or food you should feed your baby, and for someone like me it becomes a struggle because I am on*

		my own as the father is not playing any role. We resort to feed our babies porridge because we cannot afford the formula milk"
Pressure_Family	Mother identifies or experiences pressure from her family on infant feeding	*"...the very same family that pressurise you into buying formula milk does not help to buy it when you run out of it. They are just quick to comment and suggest that you are starving the baby and you should add formula milk but they won't be there to help you buy the formula when you struggle you will be on your own"*
Pressure_Partner	Mother identifies or experiences pressure from her partner on infant feeding	*"...when you explain that the child will be sick he will tell you that he will give you money to take the child to the doctor or buy more formula milk to feed the baby"*
Category: CULTURAL BELIEFS AND PRACTICES **Subcategories:** Infant and Infant Feeding; Maternal Behaviour; HIV; Sex; Traditional Healing and Medicine		
INFANT AND INFANT FEEDING		
CommBel_ BF/FF/CF/MF	Mother acknowledges a community perception or belief about infant feeding	*"They believe that breastfeeding has health benefits for your child and some believe that breastfeeding will restrict them as they won't have time to socialise"*
CommPrac_ BF/FF/CF/MF	Mother acknowledges or describes a community convention/practice/how the general community feeds children	*"Because I grew up seeing other people feeding their children formula milk and breast milk and also fed my first child that way"*
OtherMothers_ BF/FF/CF/MF	Mother refers to the practices of other mothers and their feeding practices	*"...they don't have any breast milk problems and use work as an excuse not to breastfeed although one can express milk before she leaves for work and when she comes back from work"*
CommBel_ InfantSize/Weight	Mother acknowledges a community perception or belief about infant size/weight	*"If your child is small people believe your child is malnourished or is because you are not breastfeeding and if your baby is big they compliment and encourage you not to stop breastfeeding"*
MATERNAL FACTORS		
OtherMothers_ BF	Mother refers to the breastfeeding practices of other mothers	*"I can see other young mothers who sometimes regret when they can't go to social activities because they have to breastfeed their children"*
OtherMothers_ FF	Mother refers to the formula feeding practices of other mothers	*"...some mothers don't wash the bottle properly or they just take a bottle that was left overnight and just prepare without discarding the left over, some mothers are drinking and they don't even care how clean is the baby's bottle"*

MatBeh	Mother acknowledges a community perception or belief about the effect of maternal behaviour on the infant	*"People think that as a mother you are not looking well after the baby and you do not care about the baby."*
HIV		
CommBel_HIV	Mother acknowledges a community perception or belief about HIV	*"...when you lose a lot of weight they think you are HIV positive"*
CommBel_HIV_BF	Mother acknowledges a community perception or belief about HIV and breastfeeding	*"...it is believed that HIV-positive mothers do not breastfeed because they will infect their babies"*
CommBel_HIV_FF	Mother acknowledges a community perception or belief about HIV and formula feeding	*"If you feed your baby Infacare and Pelagon they associate that with being HIV-positive"*
OtherMothers_HIV	Mother refers to the other mothers when discussing the subject of HIV	*"...there was a lady that I met at the clinic to fetch my treatment and she was there for her treatment too and she told me she decided not to breastfeed because of her HIV status"*
SEX		
CommBel_Sex	Mother acknowledges a community perception or belief about sex	*"We heard that when we grew up that you should abstain from sex when your baby is still young..."*
CommBel_Sex_BF	Mother acknowledges a community perception or belief about sex and breastfeeding	*"I overheard my sister talking to other mothers about this when I had my first child, saying that if you engage into sex with the father of the baby while you are still breastfeeding that will affect the baby and make the baby weak..."*
CommBel_Sex_EffectInfant	Mother acknowledges a community perception or belief about the effect of sex on the infant	*"...yes because there are children in the community where people comment about unattractive babies and they assume that their mothers are sexually active"*
TRADITIONAL HEALING AND MEDICINE		
CommPrac_TradHeal	Mother acknowledges or describes a community convention/practice in terms of traditional healing or medicine	*"...people advise me to give my child formula but still my child's condition does not improve people will refer to a traditional healer who will tell you that your child has Plate and will cut your baby at the back..."*
TradMed	Community belief or perception about infant illness and traditional medicine	*"The white substance in the child's tongue and if the child is not given the Plate medicine to treat it will make the child sick"*
Category: CONTEXTUAL **Subcategories:** Poverty-related Factors, Environmental factors, Services available		
ContextFactor_BF/FF/CF/MF	Mother identifies a contextual factor that has bearing on a specific feeding practice	*"I did not hear it from anybody but since there is formula milk in the shops I thought I could buy it and alternate it with breast milk"*

Food availability	Mother discusses food availability	*"I am from a poor but loving and caring family, we never bothered about the good smell of food from next door even if we only had pap and soup for supper as long as we had something to eat, so your child should just accept what you have at home"*
Germs	The effect of germs on infant feeding	*"we are living in filthy conditions where there is dirty water running in the street because there is no sanitation and there is always flies all over and now that we are approaching summer flies will be all over the place so hence you have to keep your baby's bottle covered all the time"*
Buying/Selling Formula	Mother describes the process of buying or selling formula in her community	*"we are told that we will not be supplied free formula milk any more at the clinic because another lady approached me with A far less price of R15 and I asked her where did she get that formula milk and she told me at the clinic..."*
PracticalFactor_ BF/FF/CF/MF	Practical factors associated with a specific feeding practice	*"...I won't have time to do so because I leave home very early before sun rise and come home very late after sun set..."*
Difference_EC and WC	Mother identifies differences between Eastern Cape and Western Cape communities	*"It is not good to be without your parents but I cannot expect my mother to leave her house and to be with me and also I cannot relocate to Eastern Cape because there are no better opportunities in Eastern Cape than here in Cape Town"*
Rural	Mother describes feeding practice/maternal behaviour as it occurs or is understood in rural areas	*"...in the rural areas when your child is under 6 months your in-laws do not allow you to sleep under the same room/bedroom with the child's father although we are not told by the elders the exact reason behind that..."*
Health Care	Mother describes an interaction with an intervention or service available in the community	*"The Mentor Mothers at the hospital and they explained to us how to use the measurements if you choose to bottle feed"*
Modernvs.Old	Mother makes a comparison between how feeding occurs in the present time as opposed to a different era	*"Nowadays we believe that is the nutrition for babies whereas in the olden days children could grow properly and well without being fed formula milk"*

Appendix L

List of codes

Mother	Infant	Feeding	Family+Partner	Community	Context
AG_IF	AppealingInfant	Belief_BestWay	AR_BF_Family	AR_BF_Comm	AR_BF_HCW
Challenges_Motherhood	CryingInfant	BF_Stopped	AR_CF_Family	AR_CF_Comm	AR_CF_HCW
Challenges_First time mother	FeedingReaction_BF	BFInitiation_No	AR_FF_Family	AR_FF_Comm	AR_FF_HCW
Concern	FeedingReaction_CF	BFInitiation_Yes	AR_HIV_Family	AR_HIV_Comm	AR_HIV_HCW
Confusion	FeedingReaction_FF	BreastMilk_Enough	AR_IF_Family	AR_IF_Comm	AR_IF_HCW
Don't Know Why	FeedingReaction_MF	BreastMilk_Not Enough	AR_Medicine_Family	AR_Medicine_Comm	AR_InfantIllness_HCW
FirstTimeMother	HIVStatus and Infant	BreastMilk_Supply	AR_MF_Family	AR_MF_Comm	AR_Medicine_HCW
HIV+ _disclosed	Illness_Traditional Healer	Challenge_BF	AR_OL_Family	AR_OL_Comm	AR_MF_HCW
HIV+_Status	Infant_Preference	Challenge_FF	AR_Sex_Family	AR_Sex_Comm	AR_OL_HCW
HIV+_undisclosed	Influence_IF_Infant	Challenge_CF	AR_HIV_ Partner	AR_Sex_Friends	AR_Sex_HCW
Mixed Messages	(preference)	Challenge_IF	AR_IF_ Partner	CommBelief_BF	ContextFactor_BF
Mother'sWeight	Infant_Growth_BF	CurrentlyFeeding_BF	AR_Medicine_ Partner	CommBelief_CF	ContextFactor_CF
Mother'sDiet/FoodIntake	Infant_Growth_CF	CurrentlyFeeding_CF	AR_Sex_ Partner	CommBelief_FF	ContextFactor_FF
Mother'sHealth_Breastfeeding	Infant_Growth_FF	CurrentlyFeeding_FF	HIV_disclosed_Family	CommBelief_MF	ContextFactor_Gen
MotherKnowsBest	Infant_Growth_Gen	CurrentlyFeeding_MF	HIV+_undisclosed_Family	CommBelief_OL	ContextFactor_MF
Mother_Responsibility	Infant_Growth_MF	CurrentlyFeeding_OL	HIV+_disclosed_Father	CommBelief_Medicine	Difference_EC and WC
NegativeExperience_BF	Infant_Health_BF	FeedingComparison	IF_V/P_Family	CommBelief_InfantIllness	Germs
NoConcern	Infant_Health_CF	FeedingChallenges_HIV	IF_V/P_Partner	CommBelief_InfantSize/Weight	HIV_disclosed_HCW
NoInfluence_	Infant_Health_FF	Feeding in Public	Influence_IF_Family	CommBelief_HIV	IF_V/P_HCW
OwnView_BF/FF/CF/MF	Infant_Health_Gen	Feeding_Effort	Influence_IF_Father	CommBelief_HIV_BF	Influence_IF_HCW
OwnView_HIV_BF	Infant_Health_MF	FeedingPlan_Future	Input_BF_Family	CommBelief_HIV_FF	LoaningMoney_FF
OwnView_HIV_FF	Infant_Mother_Relations	FeedingPlan_Time	Input_BF_ Partner	CommBelief_Sex	LoaningMoney_CF
OwnView_HIV_MF	hip	FeedingProcedure_BF	Input_CF_Family	CommBelief_Sex_BF	MentorMothers
OwnChoice	Infant_Weight/Size_BF	FeedingProcedure_CF	Input_CF_ Partner	CommBelief_Sex_EffectonInfant	ModernTimes

OwnView_Convergent	Infant_Weight/Size_CF	FeedingProcedure_FF	Input_FF_Family	CommBelief_MatBeh	Poverty
OwnView_Divergent	Infant_Weight/Size_FF	FeedingProcedure_MF	Input_FF_ Partner	CommBelief_Mother's Weight	PracticalFactor_BF
OwnView_InfantSize/Weight	Infant_Weight/Size_Gen	FeedingProcedure_OL	Input_IF_Family	CommInfluence_InfantFeeding	PracticalFactor_CF
OwnView_Sex	Infant_Weight/Size_MF	Feeding_NoSupport	Input_IF_ Partner	CommPractice_InfantIllness	PracticalFactor_FF
OwnView_Sex_BF	InputR_Infant	FF_Supply	Input_MF_Family	CommPractice_BF	PracticalFactor_Gen
OwnView_Sex_Effect on Infant		FF_Stopped	Input_MF_ Partner	CommPractice_CF	PracticalFactor_MF
OwnView_Sex_NoEffect		Formula_NotEnough	Input_OL_ Partner	CommPractice_FF	Rural area
OwnView_TradHealer		InputR_BF	Support_Social_Family	CommPractice_Medicine	Rural life
PersonalFactor_BF		InputR_CF	Support_Fin/Mat_Family	CommPractice_MF	Support_FacilityBased_IF
PersonalFactor_CF		InputR_FF	Support_Social_Partner	CommPractice_Ol	Support_FacilityBased_HIV
PersonalFactor_FF		InputR_HIV	Support_Father of Child	CommPractice_Feeding	
PersonalFactor_MF		InputR_Medicine	Support_Fin/Mat_Partner	CommPractice_TradHealer	
PositiveExperience_BF		InputR_MF		IF_V/P_Comm	
PersonalFactor_Motherhood		Medicine		OtherMothers_BF	
Pressure_Family		PC_Different		OtherMothers_CF	
Pressure_Partner		PC_Same		OtherMothers_FF	
Pressure_Community		ReasonFor_BF		OtherMothers_Gen	
Pressure_Effect		ReasonFor_CF		OtherMothers_HIV	
ReportsAbstinence		ReasonFor_FF		OtherMothers_MF	
ShowedInfluence_		ReasonFor_MF		Support_Social_Community	
Stigma		ReasonFor_BF+FF			
Stress		ReasonFor_FF+CF			
Uncertainty		ReasonForNot_BF			

Appendix M

Turn it in originality report

M.Marlow_Thesis

ORIGINALITY REPORT

%8	%1	%0	%7
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of Stellenbosch, South Africa Student Paper	%2
2	Submitted to Grand Canyon University Student Paper	%1
3	advances.nutrition.org Internet Source	<%1
4	Submitted to Loma Linda University Student Paper	<%1
5	Submitted to University College London Student Paper	<%1
6	Submitted to School of Engineering, The University of Tokyo Student Paper	<%1
7	Submitted to University of South Alabama Student Paper	<%1
8	Submitted to London School of Hygiene and Tropical Medicine Student Paper	<%1
9	Submitted to Polk State College Student Paper	<%1